

AVIATION TURKEY

ONWARD & UPWARD
TURKEY'S BALLOONING
INDUSTRY ASCENDS
SKYWARD

WHAT DO WE
EXPECT IN THE
FUTURE **FOR THE**
BUSINESS JET
MARKET?

**PERFORMING
BETTER & FASTER**
DRONES BECOMING
FUNDAMENTAL IN MANY
BUSINESSES

STM TAPS INTO
THE ENORMOUS
OPPORTUNITY IN CIVIL
AVIATION

TWO BIG
THRESHOLDS OF
THE AIR CARGO
MARKET

DIGITAL
TRANSFORMATION
QUICKENS
PEGASUS'S
COMPETITIVE
ADVANTAGE

**EXCELLENCE IN
MAINTENANCE**
MYTECHNIC HAS
TOUCHED THE LIVES
OF OVER 240 MILLION
PASSENGERS





ACT Airlines,
listed number 41 in the research
“Turkey’s Top 500 Service Exporters”
made by Turkish Exporters Assembly.

With **550 tons** of cargo capacity offered
by **5 Boeing 747-400** cargo aircraft,
ACT Airlines is the only Turkish cargo company that carries
the Turkish flag all over the world with pride.





GROUND HANDLING
PARTNER

YOUR TRUST IS OUR ASSET



PROVIDING HIGHEST LEVEL OF GROUND HANDLING SERVICE
24/7 ON CREDIT ALL OVER THE WORLD

Florya, Yamaç Sokak No:2/1 34154 Istanbul - Turkey
0090 212 6633718 0090 212 541 1090
Sita: ISTZGXH - ISTSGOR - ISTSGXH
Aftn: LTBAFLYO
www.flyserviceturkey.com.tr
commercial@flyserviceturkey.com.tr
occ@flyserviceturkey.net
teknikdestek@flyserviceturkey.net



AVIATION TURKEY

VOLUME 1 - YEAR 2019 - ISSUE 2
ISSN 2667-8624

Publisher & Editor in Chief

Ayşe Akalın
a.akalin@aviationturkey.com

International Relations & Advertisement Director

Şebnem Akalın
sebnem.akalin@aviationturkey.com

Chief Advisor to Editorial Board

Can Erel / Aeronautical Engineer

Translation

Tanyel Akman

Proof Reading & Editing

Mona Melleberg Yükseltürk

Graphic Design

Gülsemin Bolat
Görkem Elmas

Advisory Board

Aslıhan Aydemir
Serdar Çora
Renan Gökyay
Murat Keleş
Lale Selamoğlu Kaplan
Assoc. Prof. Ferhan Kuyucak
Şengür

Adress

Administrative Office
DT Medya LTD.STI
İlkbahar Mahallesi Galip
Erdem Caddesi Sinpaş
Altınoran Kule 3 No:142
Çankaya Ankara/Turkey

Tel: +90 (312) 557 9020
info@aviationturkey.com
www.aviationturkey.com

© All rights reserved.
No part of publication may be reproduced by any means without written permission.

Managing Editor

Cem Akalın
cem.akalin@aviationturkey.com

Administrative Coordinator

Yeşim Bilginoğlu Yörük
y.bilginoglu@aviationturkey.com

Editors

Muhammed Yılmaz/
Aeronautical Engineer

İbrahim Sünnetçi

Şebnem Akalın
Saffet Uyanık

Photographer

Sinan Niyazi Kutsal

İmtiyaz Sahibi

Hatice Ayşe Evers

Basım Yeri

Demir Ofis Kirtasiye
Perpa Ticaret Merkezi B Blok
Kat:8 No:936 Şişli / İstanbul
Tel: +90 212 222 26 36
demirofiskirtasiye@hotmail.com
www.demirofiskirtasiye.com

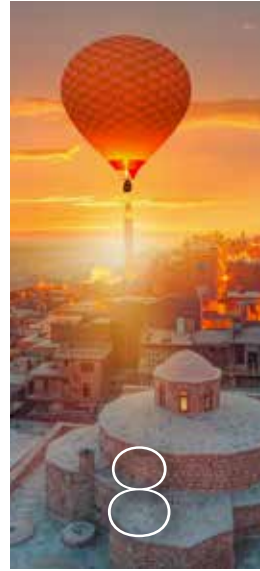
Basım Tarihi

Kasım - 2019

Yayın Türü

Süreli

cont e



Onward
and Upward
Turkey's
Ballooning
Industry
Ascends
Skyward

Turkish State
Meteorological
Service Tracks
and Utilizes
Weather
Data with an
Expanding
Observational
Network



What do We
Expect in
the Future
for the
Business Jet
market?



nts



36
Two Big
Thresholds of
the Air Cargo
Market

42
Global Air
Cargo and
Turkish
Cargo

56
Digital
Transformation
Quickens
Pegasus's
Competitive
Advantage



72
Singapore
Airlines The
World's
Longest,
Non-Stop
Commercial
Flight
Operator

48
Excellence in
Maintenance
myTECHNIC
has touched
the lives
of over
240 million
passengers



100
Travel
Experience
Elevated
to New
Heights with
Emirates

Journey of the Turkish Aviation Industry

Anticipating Opportunities, Facing Challenges, Taking Action

Over the past years the aviation industry has seen a number of changes from digitalization to technological innovation, low cost solutions to global competition concerns, the winds of change buffeting the industry can come from many directions. The coming years are likely to be more turbulent, as a new wave of technological change and innovation unfurls. How will the Turkish Aviation Industry shape itself, address risks, and take advantage of opportunities in the next decade?

In today's competitive landscape it is essential to stay one step ahead. Within that context, Turkish companies are more focused on some niche areas with its low-cost labor rates and fast-developing technology.

Have a comprehensive look at the industry insights!

Gökbey Multirole Helicopter was developed by Turkish Aerospace company, as a new generation, twin engine, 6-ton class helicopter in response to the growing market demand for higher mission flexibility in this class. Moreover, thanks to its long-term cooperation with major aircraft manufacturers, it designs and manufactures aerostructures for A350 XWB, A330, A321, A320, A319, Bombardier C series, B787, B737, AW139 Helicopters

STM has developed and deployed indigenous systems such as Electronic Flight Bag Capabilities (AeroTab™) and Paperless Cockpit-Cabin-Operation Center Integration (AeroSuite™) solutions as well as OpsMet™ web-based meteorological analysis application and OpsEye™ real-time Apron Area Air & Ground Surveillance Systems. The AeroTab Electronic Flight Bag is currently operated by Atlasglobal, as well as Atlasjet Ukraine, in a number of aircraft. OpsEye is actually a software product and is currently being used in the Turkish Airlines Integrated Flight Operations Center. Turkish Airlines has managed both flight and ground operations smoothly even under these adverse conditions. After proving the effectiveness of this system in the field, this system was expanded to a total of 12 airports, including the Istanbul Airport in Turkey and the Turkish Republic of Northern Cyprus Nicosia airport. As a company that increases its awareness and effectiveness in the field of Civil Aviation, STM signed a multifaceted cooperation protocol with the General Directorate of Civil Aviation (DGCA) in January last year covering many areas of civil aviation. In particular, this protocol draws attention to "cybersecurity cooperation", "aviation

security cooperation" and "airworthiness".

Havelsan a leading company in simulation, designed the Boeing 737-800NG Full Flight Simulator and delivered it to Turkish Airlines (EASA) with a CS-FSTD-A FFS Level D certificate and continues to manufacture 11 simulators for Turkish Airlines' A320 and Boeing 737 MAX platforms, 5 of which are Full Flight Simulators. They are also working with the General Directorate of State Airports Administration (DHMI) and TÜBİTAK on Air Traffic Control and Airport Surveillance Radar Simulators.

Onur Engineering is helping to increase safety in the air traffic control and management sector with a strong emphasis on security in voice communications. Onur's VCS&VRS systems are now serving the Turkish ANSP DHMI (General Directorate of State Airports Administration). After the planned delivery of 7 new systems Onur's solutions will be present in 11 airports in Turkey.

AYESAŞ designed HTAWS to reduce the risk of Controlled Flight Into Terrain (CFIT) accidents of rotary wing aircraft by providing increased situational awareness of the surrounding terrain and obstacles, mainly during the cruise phase in Visual



Meteorological Conditions (VMC) and in Instrument Meteorological Conditions (IMC) under Instrument Flight Rules (IFR).

In the field of Aviation Composites, CES Advanced Composites company is one of the suppliers of major programs such as H135 carried by Airbus and Lockheed Martin-Sikorsky.

Kale Aero is a key supplier to Boeing, Korean Aerospace Industries and Spirit in the



Boeing 737, 747, 777 programs. Kale delivers parts to PFW-Airbus for the Airbus A320, A321 and A319 programs as well.

TCI designs and manufactures aircraft galleys, i.e. the kitchen area for food preparation on an aircraft. In the Boeing B737 programs, TCI succeeded in the design and production of galleys that are approximately

10% lighter than those of competitors. TCI received orders for many prestigious Boeing and Airbus programs and has been awarded many programs to design and manufacture Galleys and Monuments for Turkish Airlines, SunExpress, Jet Airways, SpiceJet and Donghai Airlines.

TSI is the aircraft seat supplier for Boeing and Airbus aircraft and has

a close relationship with Turkish Airlines with orders for seats on almost 400 aircraft. The company had agreements with Freebird Airlines, Azerbaijan Airlines, Nordavia Airlines and Nordwind Airlines, and also struck deals with other leading Airlines.

It is clear that Turkish industry extensively benefits from its labor rates, which are the lowest compared to other

major countries in the sector. It can grow sustainably in the future – and maximize its potential to deliver marketing benefits that greater connectivity brings.

Ayşe Akalın
Editor in Chief

A handwritten signature in black ink, appearing to read 'Ayşe Akalın', is positioned below the printed name and title.

TEAM



Saffet Uyanık
Editor

Can Erel
Chief Advisor to
Editorial Board

Şebnem Akalın
International
Relations &
Advertisement
Director

Ayşe Akalın
Publisher & Editor
in Chief



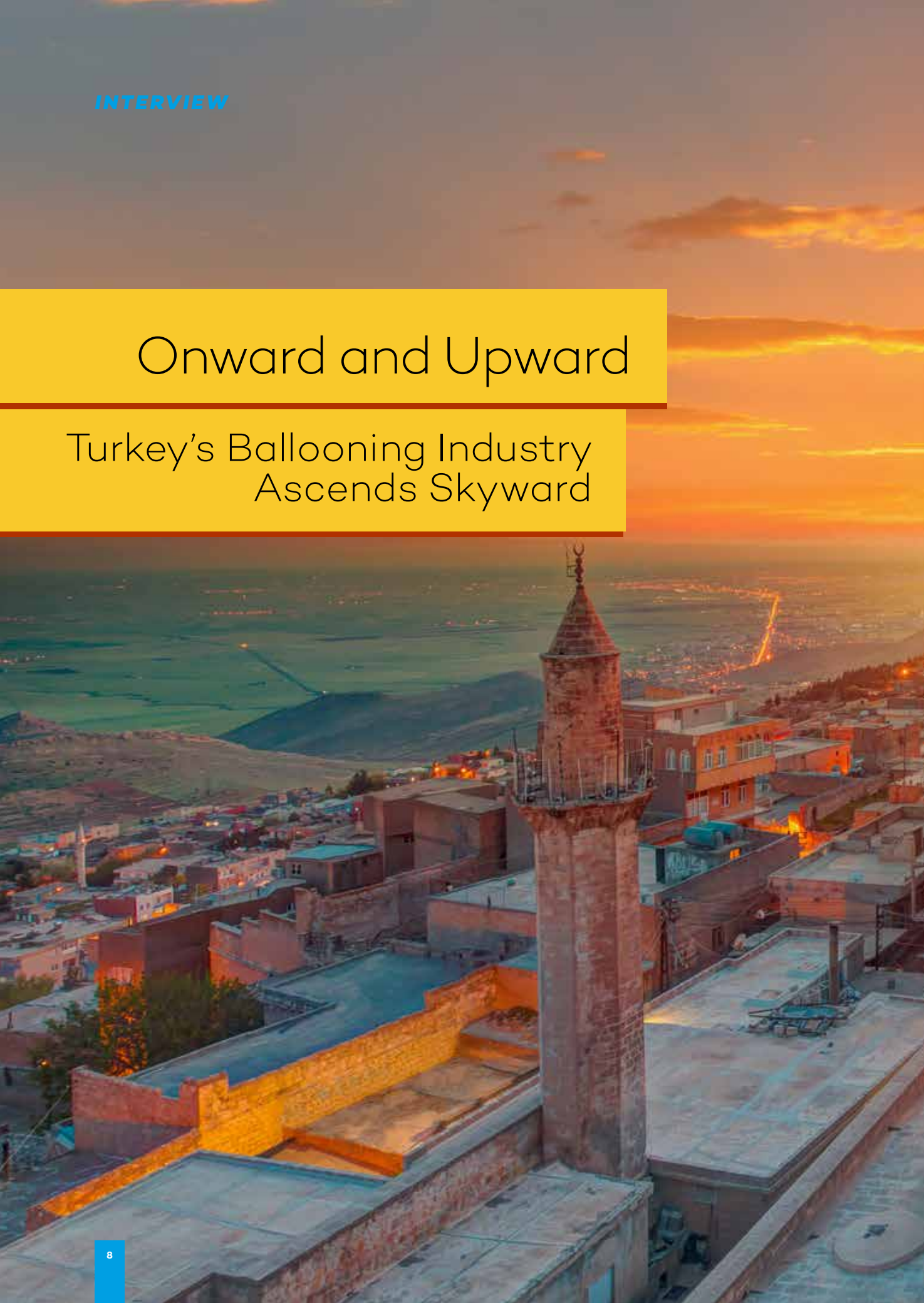
Yeşim Bilginođlu
Yörük
Administrative
Coordinator

Cem Akalın
Managing Editor

İbrahim Sünnetçi
Editor

Onward and Upward

Turkey's Ballooning Industry
Ascends Skyward





Mardin



© Aviation Turkey

In this interview Bahri Kesici - Director General of Civil Aviation discusses how Turkey's Ballooning industry offers a unique Bird's Eye view of Turkey's Famous Touristic Regions and continues to attract new Entrepreneurs and Economic Opportunities in various regions throughout Turkey

✈️ Aviation Turkey: The hot air balloon business has become a globally recognized hotspot in Turkish tourism and civil aviation. Could you please tell us about the developments in this field over the years, the sectoral size and the level our country has reached in balloon transport?

Bahri Kesici: Civil aviation and tourism sectors are interrelated sectors that support and augment each other as developments in one sector often are a driving factor for the other. In this context, it is better not to limit civil aviation as just a mode of transportation only for airway travel

and transportation opportunities because civil aviation also supports the cultivation of tourism. Of course, airline connections and the development level of flight networks are the primary factors in the development of tourism, however, civil aviation has a unique opportunity to diversify tourism activities

in terms fields of activity as well as potential economic returns through foreign trade. Aviation activities with hot air balloons are also a good example of this. Considering the historical and cultural texture of our country and the tourism potential it holds with its natural beauty, hot air ballooning offers an



© Pasha Balloon

Cappadocia - Nevşehir



exclusive opportunity to experience Turkey's famous touristic regions and open-air museums from an expansive bird's eye view, up in the air.


With this understanding, the balloon air transportation business has become one of the priority issues for the General Directorate due to its contributions to the country's tourism and economy. We successfully implemented very significant projects and practices that paved the way for the development of hot air ballooning. As a result, ballooning activities have achieved significant growth and Cappadocia has become one of the largest hot air balloon centers in the world.

As of today, more than 30 hot air balloon companies are active in our country with 239 balloons now in their fleets. Considering that in 2008, we only had 10 balloon companies and 67

hot air balloons, we can clearly see that we have achieved notable progress. Since 2008 we have observed an increase of 250 percent in the number of balloon companies and the total number of balloons has soared up to 350 percent. The number of people enjoying hot air balloon tours last year exceeded a half million and reached 537 thousand 500. In 2018, more than 30 thousand balloon flights were realized, reaching a record level, and balloon tours contributed approximately €100 million to the national economy.

Today Turkey performs the largest commercial operation in the world in the field of hot air ballooning in terms of the traffic volume, number of passengers and the number of flying days. In our country, the flights are performed at an average of 200 to 260 days annually, with an average of 90 flights per day. Turkey is a country that hosts the

world's highest number of commercial balloon flights. The large number of flights that occur in Cappadocia in just a day can only be accomplished at festivals at other select destinations around the world.

 **Aviation Turkey:** We know that the Turkish General Directorate of Civil Aviation directly impacts and contributes to this increase. Could you please evaluate the effects that triggered the developments in this field in recent years in terms of the Turkish Civil Aviation Authority?

Bahri Kesici: As I mentioned before, hot air ballooning has become one of the most important activities of our General Directorate due to its contribution to tourism and economy. In particular, the launch of the Balloon Slot Center in 2013 is an important indicator of our determination on this issue. With the launch of this center in Nevşehir, the

number of slots for balloon flights is now evaluated on an enterprise basis. This step is highly critical to enable safer and more uniform balloon flights while enhancing the current potential and number of flights.

Another step that we have taken is towards enhancing existing potential through the application of balloon flights during two periods daily by issuing the Balloon Flight Measures Circular. We also put into effect the Cappadocia Balloon Flights Meteorological Evaluation Circular for the examination of the meteorological conditions of the Cappadocia balloon flight area, for the analysis of the reports, coordination and meteorological evaluation prior to flights.

We aimed to achieve sustainable growth by preparing several regulations to ensure that ballooning services are



© Voyager Balloon



© Voyager Balloon

INTERVIEW

performed at international standards. We have enacted many legal regulations that range from the language competence of pilots, working hours, and to licensing procedures to make pilot licenses aligned with international legislation. Again, we ensured that the balloons' ground teams are certified according to the standards and training requirements set by our General Directorate.

For the development of the sector, we have also put into practice the necessary regulations for the balloons to fly over water. Also, in order to ensure flight safety, we have implemented a project for tracking the balloons with a GPS-based system, and thus, it became possible to instantly detect violations and keep flight data electronically. On the other hand, we are able to record all air band radio conversations through the tower we built for observation and recording. As a consequence of these regulations aiming at more proper and safer balloon flights, the hot air ballooning business has become more preferred by investors and entrepreneurs.

As a matter of fact, the increase in the number of enterprises, the experience provided in balloon flights and the regularization of the legal infrastructure formed a critical foundation for the popularization of hot air ballooning in other



Pamukkale - Denizli

regions of our country. From this point of view, we have taken important steps to pave the way for the sector by increasing our inquiries and research in order to also provide balloon flights in different regions of our country in addition to Cappadocia. Within this context, we have taken measures to make Pamukkale the future center of attraction for balloon tourism.

✈️ Aviation Turkey: How are Hot Air Balloon tours performed? What's involved, what are the stages and required expertise?

Bahri Kesici: As it is known, balloon flights are performed for exploring historical, cultural or touristic areas from a specific height. Passengers can experience balloon flights for a fee and have the chance to see these historical and touristic areas from the sky. There is a pilot, observer pilot if any, and ground team members for balloon flight operation. Passenger

names, nationality and gender information are recorded for each flight and boarding passes are issued for each passenger during balloon flights. Prior to the flight, passengers are informed about the procedures to adhere to before and during the flight and for landing. The balloon is then inflated with normal air first and once its dome rises, the passengers are taken aboard the basket and the balloon flight begins as the basket begins to rise following the hot air hot hair inflation process.

✈️ Aviation Turkey: In which regions of Turkey are balloon flights performed today?

Bahri Kesici: As you know, in order to promote and popularize ballooning activities in different regions of our country apart from the Balloon Flight Area in Cappadocia, we have issued a circular on "Flights to be performed in regions except for the Cappadocia Balloon Flight Area".

As a result of the evaluation

of the demands received within the scope of this circular that was issued in order to contribute to the tourism sector of the country, 9 zones were found to be appropriate for hot air balloon flights: Burdur-Bucak, Denizli-Pamukkale, Adana-Kozan, Bitlis-Ahlat, Ankara-Polatli, Afyon-Ihsaniye, Eskisehir-Seyitgazi, Samsun-Bafra and Aksaray-Ihlara.

In 2017, we launched balloon flights in the Pamukkale region and granted licenses to 8 companies to carry out commercial aviation activities with hot air balloons. In 2019 in addition to these 8 companies that meet the legal requirements, we granted 5 more preliminary permits to 5 companies that completed the requirements. If these companies are also entitled to obtain an actual license, the number of companies operating in Pamukkale will increase to 13 and a substantial contribution will be achieved for the tourism potential of the region.

After Pamukkale, necessary efforts were completed for İhsaniye and İhlara and balloon flights were launched. Finally, we allowed 30-day test flights in the Dara region of Mardin, which is one of the most important settlements of Mesopotamia with its natural beauty and historical texture.

Aviation Turkey: What are the suitability criteria for the balloon flight regions? Which processes are necessary for the granting of airworthiness and operational approval?

Bahri Kesici: Balloon flight companies can apply to

our Directorate General by completing the Flight Permit Request Form to obtain a flight permit. In these applications, the approval letters of the Governor and the Municipality regarding the security, culture, history and other aspects of the region should also be available. In addition, the necessary information and documents regarding the intensity and direction of the wind in the region for the last three years must be obtained from the Meteorological Directorate and included in the application. These applications will be subjected to a pre-

assessment by the Directorate General in the first stage and the meteorological history, wind conditions and land conditions that may directly or indirectly affect balloon flights are examined by technical teams and a preliminary report is prepared for the related application. In the second stage, we carry out on-site examinations. The information on the application that is pre-assessed is reviewed by our technical teams in order to obtain the real conditions of the region. If the evaluation is positive, the coordination phase is initiated, and the

opinions of relevant military and civilian institutions and organizations are obtained in order to determine whether there are any restrictions in the region.

Balloon flights are not allowed in the vicinity of airports, in prohibited, dangerous, restricted zones and restricted areas designated by NOTAM. Again, balloon flights should not pose any risk to people and properties on the ground. Wind limits must be suitable for landing and take-off, and there must be no obstacles that affect safety within and above the flight destination. The

AIR MEDICAL SERVICES



REDSTAR AVIATION



Air Ambulance

Operates with four Bombardier Learjet45 XR dedicated air ambulance aircraft configured with dual ICU stretchers and offers medevac service globally.



Medical Escort

Covering each and every step of the mission including medical clearance, stretcher arrangements and all other needs, may be offered as a package solution in wide range area including 182 countries.



Secondary Services

Ground Transport (both medical & non-medical), hospital referral & admission as supplementary services.



www.redstar.com.tr
redstar@redstar.com.tr



+90 216 709 1 772 Alarm Center
+90 850 433 1 772 OPS Direct

INTERVIEW

area in the direction of the wind should be free from obstacles and wide enough to allow safe landings. If all processes are successfully completed, we inform the applicant that the area is suitable for balloon flight.

✈️ Aviation Turkey: What developments are happening on the production side (design and manufacture of balloons and balloon-related vehicles and infrastructures) in parallel with developments in hot air ballooning?

Bahri Kesici: Even though Turkey is in the leading position in the world for hot air ballooning, the production side is dealt very little. The currently used balloons are supplied from countries such as the U.K., Spain and the Czech Republic. However, our local production entrepreneurs have taken serious steps to complete required processes in the last few years and have reached the certification phase. It is expected that locally produced balloons will start to be used this year.

✈️ Aviation Turkey: What types of activities is the aviation authority conducting in terms of formal and informal education in the fields of balloon piloting and operation?

Bahri Kesici: First of all, all personnel working in balloon companies should receive basic, refresher and on-



the-job training in order to render balloon flights at international standards. The operator should prepare the training programs as operating manuals, submit them to the Directorate General for examination and carry out the training in accordance with the program as deemed appropriate. Approved flight training courses are available to provide balloon pilot training. We license these courses after the necessary audits are completed. In addition, there are balloon piloting departments at 2-year vocational high schools. Graduates of these schools are licensed to be hot air balloon pilots provided that they are successful in theoretical exams and skill tests.

One of the key issues for us is the performance of flights by balloon pilots according to flight safety rules. For example, balloon pilots who take a break from 1 year to 2 years should have a refresher flight of not

less than 2 hours following the successful completion of the Flight Principles, Emergency and Balloon General courses.

Therefore, both the sustainable growth of hot air ballooning and efforts to promote it in different regions of our country depend on the safe performance of balloon operations. As the Directorate General, we have also published the Balloon Piloting Textbook which includes balloon general information, flight performance and planning, human performance and limits meteorology, navigation, fuel usage, flight principles, first aid, communication and emergency procedures.

✈️ Aviation Turkey: What would you like to say about the maintenance and repair of vehicles and related infrastructure regarding balloons in Turkey?

Bahri Kesici: As it is known, continuous airworthiness management has

been implemented for many years in complex air vehicles (aircraft, helicopters, etc.). However, this standardization for hot air balloons started to be implemented in 2016. Periodic maintenance and repairs previously under the responsibility of each company were directed to maintenance centers in order to make them more regular and safe. Currently, all maintenance, repair and airworthiness procedures of hot air balloons are performed only by authorized maintenance organizations and this has significantly increased their safety.

✈️ Aviation Turkey: Would you like to convey additional messages for our readers?

Bahri Kesici: Balloon tourism continues to be a very attractive and developing sector. I wish for ballooning to become popular in our country in the same way that airlines have flourished and become popular.

I wish you all safe flights 🍀



These awards aren't actually for us,
it was given to millions of passengers who preferred us.

thank you!

CITY AIRPORT
SABİHA GÖKÇEN





by Cem Akalin

ICAO 2019 Council and Presidency Election

Status and Position of Turkey in the ICAO

The International Civil Aviation Organization (ICAO) was established by participating States on December 7, 1944 under the roof of the United Nations to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention). With 193 member states, one of which is Turkey as a founding member, the ICAO is a UN specialized agency that sets global standards and recommendations on international civil aviation. The primary objectives of the ICAO are to establish international standardization in the field of civil aviation and to set norms to ensure flight safety and sustainability of civil aviation across the world. The ICAO develops, regulates and approves all kinds of international standards related to aircraft operations. It supports the establishment of facilities and provision

of services needed for operations, produces regional expedition plans and sets aviation safety standards. In addition, it regulates procedures regarding community healthcare, immigration and customs, provides technical assistance to help countries meet ICAO standards and recommendations, prepares and publishes world aviation statistics, conducts international aviation law agreements, and inspects the environmental impact of activities on civil aviation. One of the main tasks of the ICAO is to guide member states on international air transport issues, and to identify economic policies and to establish legal regulations.

As specified in Article 44 of the Convention on International Civil Aviation, the ICAO's objectives also include planning to encourage the development of international air navigation technology and international air transport.

The ICAO operates according to the United Nations (UN) system. The decision-making bodies of the ICAO are the Assembly and the Council. The ANC (Aviation Navigation Commission) and the committees are under the responsibility of the Council. There are 5 main divisions within the Secretariat. These are the Air Navigation Bureau, Air Transport Bureau, Technical Co-operation Bureau, Legal Bureau and the Bureau of Administration and Services.

The ICAO has a total of 7 Regional Offices: the Asia and Pacific (APAC) Office, Middle East (MID) Office, Western and Central African (WACAF) Office, South American (SAM) Office, Eastern and Southern African (ESAF) Office and the European and North Atlantic (EUR/NAT) Office.

The Assembly convenes every three years with the participation of all members. Composed of 36 States, the Council

is the governing body which is elected by the Assembly. All rules necessary for the safety and security of civil aviation are determined by the ICAO and their implementation at a national level is controlled by the mechanisms established within the ICAO.

Turkey's ECAC membership and the ICAO Council 2016-2019 election process

In the 39th ICAO Assembly held in Montreal in October 2016, Turkey received 156 votes of 172 states in the election and was elected as a member of the ICAO Executive Committee in pursuit of 66 years.

ICAO activities are monitored and supported through regionally established organizations. Within this context, Turkey is a founding member

of the European Civil Aviation Conference (ECAC), a regional aviation organization. In the ICAO Council, the ECAC coordinates which countries will be nominated for the eight seats of the European region and guarantees the support for the European candidates within the framework of the agreements reached with allied organizations such as the ACAC (Arab), AFCAC (Africa) and the LACAC (Latin).

Turkey, on the other hand, established a rotation and cooperation group called the Black Sea Caspian Group (BSCG) together with Ukraine, Georgia, Azerbaijan and Moldova in order to prepare for the 2016 ICAO Council membership elections and to enhance the possible support, and performed activities to improve the cooperation with such states. Later on, it participated in the election on behalf of this group and was represented in the BSCG rotation group in the Council in 2016-2019.

In the 2016 Assembly meeting of the ICAO, it was decided to increase the number of Council members from 36 to 40, and to increase the

number of ANC (Air Navigation Commission) members from 19 to 21, and these decisions are expected to be ratified by a protocol by the states. The protocol is currently on the agenda of the Turkish Parliament and is awaiting approval. If the number of Council members increases from 36 to 40, a quota will be given to the ECAC and according to the BSCG agreement, Ukraine will be a candidate to represent the BSCG, then it will become a Representative following the election and Turkey will be able to be represented as an Alternative Representative in the Council.

Turkey's representation in the ICAO and its cooperation

The Assembly meets not less than once in three years with the participation of all member states. Each member state has one vote in the Assembly. Unless otherwise provided in the agreement, decisions are taken by a majority of votes. During the Assembly meetings, all activities of the ICAO in

the fields of technical, administrative, economic, legal and technical cooperation are reviewed in detail and the organizational divisions are guided for their future activities.

The Secretary General of the ICAO is responsible for the management of the Secretariat of the Organization and has the second most important position after the President of the Council. Dr. Fang Liu (China) currently serves as the Secretary General. The Secretariat consists of five bureaus: The Air Navigation Bureau, Air Transport Bureau, Technical Co-operation Bureau, Legal Affairs and External Relations Bureau, and the Bureau of Administration and Services.

Turkey was elected as a member state to the Council in the Assembly meeting of the ICAO in 1947 for three years and our nominations in 1977, 1980 and 1983 were not concluded due to a vote split. Because of bilateral problems, mostly political, in the field of civil aviation since the 1970s and the increasing importance of civil aviation on a global scale, and based on the acceleration of

the developments and prospective studies in our country in this field, a Bureau, responsible for ICAO activities, was established in 1978 in the Ottawa Embassy to closely monitor the ICAO's activities and this Bureau was transformed into a Permanent Representation in 1990 in Montreal.

The ICAO's areas of activity fall into the Ministry of Transport and Infrastructure and the General Directorate of Civil Aviation's main areas of expertise. In this context, during the last 5 years, 3 MoU's (MoU) were signed between the ICAO and Turkey and cooperation was enhanced. Within the scope of the NGAP project launched in 2009 under the ICAO and in the 2nd Next Generation Aviation Professionals (NGAP) Summit held in Shenzhen, China; a Memorandum of Understanding establishing ICAO-Turkey cooperation was signed including also data analysis and sharing issues. In addition, the International Association of Aviation and Space Education was established with the participation of

universities, and six universities from Turkey are among the founders of this association and 8 universities are still members. The “ICAO USOAP CMA Workshop” on 28-30 March 2017 and the “ICAO Safety Management Capacity Building Workshop” on 8-12 July 2019 held by the ICAO were hosted by our country. Azerbaijan, Qatar, Kazakhstan, Georgia and the World Health Organization participated in these workshops. Moreover, within the scope of bilateral cooperation, the Turkish Civil Aviation Academy in Istanbul continues its activities in line with the goal of an ICAO accredited educational institution.

ICAO 2019 election process and presidential race

The ICAO Council, which we mentioned briefly above, is a permanent body responsible to the Assembly. The Council has assumed the legislative and executive functions of the organization. With the latest regulation made in 2002, the election process of

the members of the Council, which consists of 36 member country representatives elected by the General Assembly for a 3 year term, takes into account the level of contribution of the countries and regional-geographical distribution of international civil aviation and the industrial sector operating in this field.

The Council performs its activities in 3 sessions between January-March, May-June and September-November. The last election of the Council, which is elected every three years, was held in two rounds in September-October 2019 and a total of 36 member states to be represented in the Council were elected under three groups.

ICAO Council elections are held in 3 groups and at the 40th Assembly meeting of the ICAO held between 24 September and 4 October 2019, Turkey remained loyal to the agreement reached in 2015 within ECAC and did not become a candidate to the Council. The following member states were elected in three groups as ICAO Council members.

Group 1 States: The States are given in order of precedence according to the air transportation: Australia, Brazil, Canada, China, UK, France, Germany, Italy, Japan, Russia, USA.

Group 2 States: Identified as priority states which are not Group 1 states but contribute to international air navigation: Argentina, Colombia, Egypt, India, Spain, Netherlands (ABIS representative), Finland (NORDICAO representative), Mexico, Nigeria, Saudi Arabia, Singapore, South Africa.

Group 3 States: The states are not elected as Group 1 and Group 2 but are which are represented in the Council due to geographical importance: Costa Rica, Republic of Cote d'Ivoire, Dominican Republic, Republic of Equatorial Guinea, Greece (CERG representative), Malaysia, Paraguay, Peru, Korea, Sudan, Tunisia, United Arab Emirates, Zambia.

On the other hand, two candidates from Italy and the United Arab Emirates compete for the presidency of the Council. Salvatore

Sciacchitano, Italy's former General Director of Civil Aviation and Italy's current ICAO Permanent Representative, was nominated for the presidency of the council to be elected for three years for the 2019-2022 period, while Aysha Alhmeli of the United Arab Emirates was nominated by other countries. Aysha Alhmeli is the first female pilot of the United Arab Emirates and has been the permanent representative of the United Arab Emirates in the ICAO for more than a decade. Here, of course, it is fair to mention that Salvatore Sciacchitano, selected as Europe's candidate, was the Executive Secretary within the ECAC which we can say is responsible for European aviation safety and in which Turkey is also a member.

The new president of the ICAO Council is expected to be publicized at the first session of the Council (presumably November 20, 2019). During this period until the first meeting of the Council, Dr. Benard Aliu (Nigeria) will be the acting President of the ICAO Council 🌐



I wish to commend Turkey's commitments and investments toward new air transport infrastructure, and its strong policy engagement recognizing the importance of aviation in so many facets of the national economy.

The role of air transport in Turkey's economic future has been given a tremendous boost with the completion of the new Istanbul Airport, as has your country's ability to attain the UN Agenda 2030 Sustainable Development Goals. It's my hope that "Aviation Turkey" will help to make clear how economic successes such as these only become possible when countries first assure their compliance to



the strategic global targets that the ICAO establishes, namely for aviation security, safety, capacity and efficiency, and environmental protection. With well over 200 million passengers now being managed so effectively each year by Turkish civil aviation, I think we can all look forward to reading about many interesting new air transport challenges and developments in "Aviation Turkey" magazine.

Dr. Fang Liu
ICAO Secretary General

Registry Certification for First Turkish Aviatrices Granted to Prof. Yurdanur Tulunay

by Aslihan Aydemir – Published in November 2019 Edition of UTED Magazine

The Gender Balance Fostering Commission (TCDGK/GBFC), within the General Directorate of Civil Aviation (DGCA), was established to monitor gender balance and to develop suggestions in order to foster gender balance in the Turkish civil aviation sector, to exert effort toward creating equal opportunities in the selection of aviation professions and to encourage, in particular, women towards education and training in fields related to aviation.

A decision was taken by the Commission to keep a register which is called the "Registry of First Aviatrices" in order to ensure national and international recognition of the first or pioneering women, who flew or contributed to flight, significantly contributed to development of aviation, or pioneered and raised awareness in the field.

On October 15, 2019, Prof. Yurdanur Tulunay, the first Turkish female Near-Earth Space professor, was presented registry certification



for "The First Turkish Aviatrices" by Bahri Kesici, Director General of the DGCA.

It is a great feeling to be part of such a process and breathe the same air with the individuals who have a broad vision in our country. One thing that crossed my mind is the fact that we seem to only become aware of these precious people when they are memorialized and when they are granted awards. Do we need each other only to applaud for a few moments? It is obvious that they don't need our applause, but we can all benefit so much in terms of being inspired

by those around us, if we could only hear what is happening around us. I don't necessarily need to be an aerospace engineer, an aircraft engineer, but feel that I need to know of the existence of such extraordinary people, as they are valuable assets in our country and we can all draw upon their inspiration and become hopeful just because of their efforts and accomplishments. Knowing and being aware of the exceptional efforts of others brings opportunity and it cultivates hope for me, and for others as we explore limitless

possibilities and potential.

Of course, most of us do not read scientific studies, articles; only a few of us follow such studies with intellectual emotions even if they are not in our domain. It is very important now and for our future to spread these types of studies so that these distinguished individuals receive recognition, even as simple as getting a routine spot on the news agenda, a way to let the public gain some insight into these areas. Now, let's learn a bit more about our valuable Professor ...

She was born on December 11, 1940 in Istanbul. She completed her Ph.D. degree in "Space Research" at the University of Birmingham. She started her activities in 1962 at California University and Fordham University in the US, then she attended the University of Birmingham in the UK, NASA Goddard Space Center in the USA, SERC Appleton and CRL Rutherford Appleton Laboratories in the UK, the Institute of Space and Astronautical Science (ISAS) in Japan, Middle East Technical University (METU), Istanbul Technical University (ITU), Selçuk University and Fırat University in Turkey.

Prof. Tulunay served as a faculty member, Deputy Dean, Head of Department, Faculty Senator and as a member of various executive boards and commissions at ITU between 1974-76 and 1983-90. She established the ITU Astronautical Engineering Department in 1986 as Head of the Department. In addition, as the Dean of the Faculty of Aeronautics and Astronautics at ITU (1997-2005), she also received the "ABET Substantial Equivalency Certificate", a part of her goals for the Faculty.

She determined the sectional dynamic correlation between the ionosphere and magnetosphere and validated it with satellite data. For example, by defining the "main ionospheric trough", she has introduced an innovation in the understanding of the dynamics of energy interaction between the Sun and the Earth. In recent years, she has been contributing to non-linear modeling studies on communication and space weather and satellite orbital dynamics with data-driven models.

Since 1973, Prof. Tulunay introduced the aerospace academic major in Turkey, initiated education in this area, created research opportunities, and adopted the mission

of educating people as well as representing Turkey at a high level at international scientific and technological events. In recent years, she has been conducting studies on Near-Earth Space physics and technology, especially in the context of communication environments and space weather. Our Dearest Professor has also been continuing her studies as a Board Member of the Turkey Space Agency.

Prof. Tulunay has a total of 227 original publications as of 7 Nov 2019, of which (70/227) are in international journals monitored by the SCI; (16/228) are presented as an "article in a book" and (141/227) are in peer reviewed proceedings of international meetings or conferences. As a typical measure on both



productivity and citation impact, a "Google Scholar Academic Search", which started in 1971, indicates that there are 1,256 cited publications and 297 of these are recorded only between (2014-2019).

I would like to state that it is an honor to have met her and that I am grateful to all the stakeholders who have provided such an opportunity.

I hope that we will increase our awareness of the value that we can bring as a nation... 🌐





by Muhammed Yilmaz

What do We Expect in the Future for the Business Jet market?

Asia Pacific Region to dominate the business jet market!

In the 1970s, there were a total of 830 business jets all over the world. Today figure exceeds 25 thousand. By the end of 2019, the volume of the business jet market is expected to reach US\$ 24.7 billion. The market size is anticipated to reach US\$ 36.4 billion by 2030 with an annual growth rate of 3.6%. The Asia Pacific Region is expected to achieve the highest growth rate and to also dominate the business jet market in addition to the commercial aviation market.

The indications for the resume of global

economic growth and the rise in the number of millionaires across the globe directly increase the demands for business jets. Emerging economies, India and China being in the first place, offer a large variety of undiscovered opportunities for business jet manufacturers. In the meantime, manufacturers continue their efforts at full steam and launch new aircraft programs one after another.

Nature of the market: fierce competition

While the main players in the business jet market

such as Bombardier, Embraer, Textron, Dassault, Gulfstream, Beechcraft, Diamond, Eclipse Aerospace, Honda Aircraft, Airbus and Boeing are working on their new models, some other companies like Eviation Aircraft, Zunum Aero and XTI are focusing on unveiling their business jets before the year 2025.

Just like the economy, worldwide business jet deliveries have cyclical fluctuations. The recession that started with the 2008 financial crisis had an adverse effect on the

business jet market. The number of annual deliveries at around 1,300 dropped to below 700. The number of business jets delivered in 2018 increased by 3.8 percent compared to the previous year and rose to 703.

The business jet market is not a high-volume industry; hence, each and every business jet delivered or ordered is significant. Within a sector where around 700 deliveries are made annually and considering the fact that more than 40 business jet models are available



GENERAL AVIATION

for customers, the table shows itself clearly. Fierce competition has, for a long time, become the standard norm in the business jet market.

North America has the largest share in the market as of 2019

North America will be the continent that provides the greatest added value to the global business jet market in 2019 as it has been for many years. It is quite possible to elucidate this fact by the existence of business jet manufacturers such as Textron (USA), Bombardier (Canada) and Gulfstream (USA), which are amongst the biggest players in the sector.

In addition, the airports in North America provide considerable convenience and advantage in the use of business jets for business trips throughout the region. Since North America has a wide geography and high trade volume, and because of the fact that business travelers prefer the

fastest transportation method that will save them considerable time, there is a strong demand for business jets in the region.

What do we expect from next generation Business Jets?

The common goal of the manufacturers in the business jet industry from

the very beginning is to improve the passenger experience and increase operational efficiency. Reducing carbon footprints during flights, decreasing operational costs, as well as improving avionics, in-cabin systems and all other systems on board are amongst the main topics that manufacturers are

Air Freight Industry- Growth Rate by Region (2018)



GENERAL AVIATION

mutually focusing on.

New generation business jets from manufacturers' assembly lines offer higher efficiency, diversity and performance at comparable prices. This increases interest in new aircraft programs and the demand for substitution of existing aircraft. It especially attracts customers willing to buy business jets for the first time.

Demand for business jets is increasing in direct proportion to the introduction of the latest technologies, such as avionics, in-cabin and connected solutions and more efficient engines. With the introduction of business jets equipped with new technologies in line with this reality, the slowdown in the second-hand sales of business jets is clearly seen. In other words, the new aircraft programs enable the growth of the business jet market.

As of the second half of 2019, the average age of the commercial jet fleet worldwide was recorded as 17.4. The average age of the Turboprop business jet fleet was 23.6. Because of the long-life of business jets and increasing maintenance costs and fuel prices, it is obvious that demand for business jets powered by new generation engines will increase in the coming years.

Certification durations challenge manufacturers

Like all aircraft manufacturers, commercial passenger aircraft manufacturers being in the first place, business jet manufacturers are also going through serious certification processes before releasing a new model to the market. In the industry, certification processes can take much longer than expected, as safety/security and zero deviation are the major acceptable criteria. Manufacturers need to conduct a lot of tests to in order for products to satisfy these two major criteria. This may lead to delays in production processes and market losses. Delays due to certification issues mean a loss of orders for manufacturers and indirectly impede market growth.

Bombardier, for example, was able to obtain the certificate of airworthiness for the Global 7500 two years after its first successful test flight. Similarly, other major players of the market suffer from the strict rules of the authorities in the certification processes, one of the most important factors limiting the growth of the business jet market.

Demand for light Business Jets will increase

Business jets are categorized under groups: light, mid-sized, large and airliner...

In the projection for the next 20 years, it is anticipated that the light business jet models will be in high demand and get a bigger slice of the market. The most important reason for this is the long-awaited initiation process of air taxi commercialization. In domestic and international flights, business jets,

especially light business jets are expected to be used actively. The best-selling business jet models in 2018 are also the biggest pillar of this anticipation.

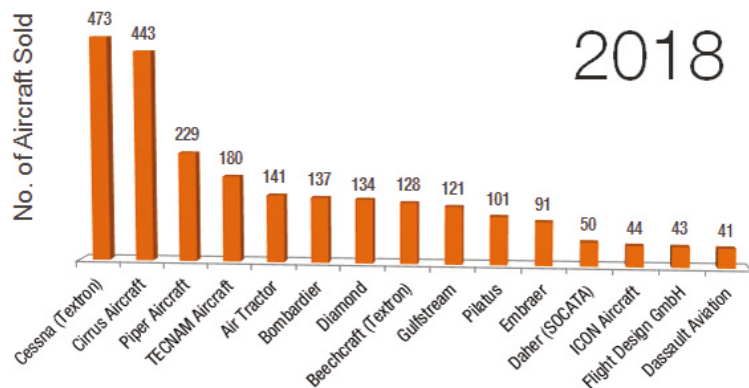
The expectation that urban air mobility will seriously increase between 2025 and 2030 brings along similar expectations in the business jet market.

OEMs to lead the market

Original Equipment Manufacturers (OEM) will make the biggest contributions to the business jet market's projection and growth strategy for the next 20 years.

The business jet market, depending on the point of sale, is divided into two main categories: OEM and after-sales service. OEMs, which are thought to play the most active role in market growth, are indispensable for both traditional and futuristic

Top-15 Best-Selling General Aviation Aircraft Models





business jet models. The growth figures of OEMs are directly related with the increase in the number of new aircraft programs in the market and the commercialization of electric and hybrid commercial aircraft.

Even if it is certain that after-sales services including Maintenance, Repair and Operations (MRO) services will grow in direct proportion to the growth of the business jet market, it is often taken for granted that the OEM segment will carry the flag on its journey into the future.

Number of operators will increase

In the business jet market, it is known that the end users of aircraft are basically categorized as private and operator. The number of operators is expected to increase further in the future in the business jet market. Considering factors such as high depreciation costs and operational and maintenance costs of the aircraft, a significant increase in the number and

efficiency of operators is expected in the future. With the increasing number of operators, it may be possible to optimize all operations of the aircraft through multiple customers. Thus, while the burden on both the operator and the owner of the aircraft is reduced, there will be a significant cost savings on both sides. In such scenarios, the increase in business jet use in the market is inevitable.

ADS-B Compliance: approaching the inevitable

As the December 31, 2019 deadline looms for aircraft owners and operators to achieve ADS-B Out compliance to maintain their privilege of operating in most US airspace, the number of business jets and turboprops that have yet to be modified remains jaw-dropping, at least to some in the industry.

What is the status of Aircraft Technology?

As in commercial passenger aircraft, when we look at business

jets from a technical perspective, it is possible to identify the main components as structural, avionics, system, cabin and engine. When we go one level down, the system category consists of sub-components like propulsion systems, electrical systems, hydraulic systems, pneumatic systems, environmental control systems, emergency systems and landing systems. With the knowledge that the OEM segment is the biggest candidate in terms of taking the most active role in the business jet market in the future, the system category is expected to create the most added value in this area. Since these systems are the backbone of all operational performance of an aircraft, they are expected to considerably increase the cost of the aircraft and hence hold the largest market share.

eVTOL effects

Business jets are mainly used by business people and companies to travel

between cities and countries in order to save time. On the other hand, urban transportation has become really complicated in many metropolises and significantly increased travel times.

Considering that traditional business jets land and take off from airports, it is an indisputable fact that they will not be a remedy for urban transportation. It is for sure that VTOL aircraft with vertical take-off and landing capability in urban metropolises will be an integral part of our lives. The eVTOLs, electric versions of these aircraft, will be the most essential component of urban air mobility as they are cheaper, more environmental friendly and less noisy.

For the commercialization of such concepts, technological advances are still needed for battery capacity issues. In addition, there is also a requirement to eliminate infrastructure problems such as the establishment of landing/take-off points and charging areas; as well as



to set the boundaries of the necessary regulatory rules required for operations. With the introduction of eVTOL technology, demand in the business jet market is expected to increase further. A business person who leaves their office and goes up to the roof of the building will arrive at the airport in a very short time to board a business jet, hence they will not waste extra time going to meetings anywhere in the world.

Fuel prices rising!

Players in the business jet market encounter the challenge of rising fuel prices. Customers do not want to spend much to carry out operations after investing huge amounts to purchase business jets. While the cost of charter services increases with the increase in fuel prices, this situation adversely affects the entire market. High fuel prices are the most important factor slowing down the growth of the business jet market in most countries.

Business jet market in Europe and Turkey

Private jets were initially introduced to the Turkish business world in the early 1990s and the number of

them in the second half of the same period reached 62 by 1999. The number of private business jets fell to 49 in 2001 with the economic crisis of the 2000s. While the number of business jets was 55 in 2008, the number increased to 98 in 2012, and it has demonstrated steady growth as of 2013 when Turkey started to attract the world's attention in an economic sense. The number of Turkish registered business jets was 117 in 2014 and 122 in 2015. According to data of the Ministry of Transportation and Infrastructure dated 27.06.2019, there are 42 air taxi companies and 32 general aviation businesses in Turkey. The number of Turkish registered business jets belonging to these enterprises is 133.

According to the report prepared by Hakan Çağlayan from Körfez Aviation, "There is no standard classification system for aircraft registered in civil aviation in European Union countries. For example, the UK lists its aircraft registrations with the maximum takeoff weight (MTOW) classification, without making any distinction between turboprop and business jet, while Poland splits the Turboprop

and Business Jets classification into two as below and above MTOW 5,700 kg."

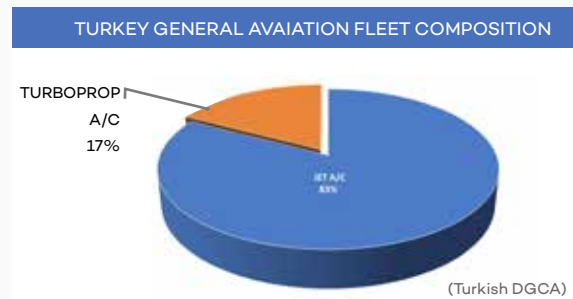
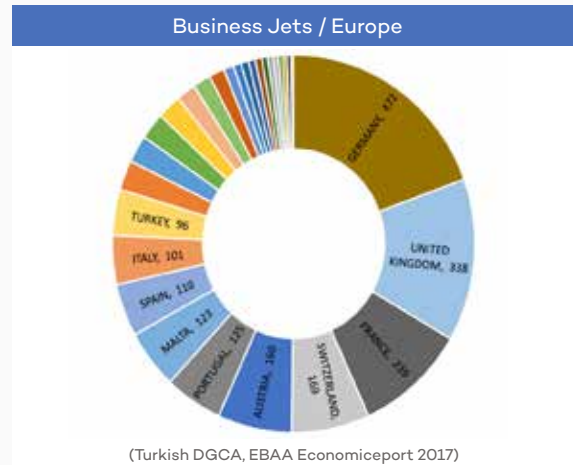
Based on the total number of registered aircraft (turboprop, business jet and helicopter) in the European continent, the top five rankings are France, the United Kingdom, Germany, Italy and Spain.

Germany, the United Kingdom, France, Switzerland and Austria are the top 5 countries on the list of 30 European countries according to the number of business jets they own. In this ranking, Turkey ranks 10th with 96 registered business jets.

Without doubt, the only success criterion of general

aviation activities is not the high number of aircraft. The measurement, assessment and comparison of this success is made according to many different criteria. Many criteria such as direct or indirect contribution to the national economy, the intensity of traffic, the average age of registered aircraft, the functionality of the regulations and the diversity of destinations are determinant details in the competitive power of the business jet market between countries.

According to 2017 data, the fleet structure in overall Europe stands out as 65% jet engine and 35% turboprop. In our country, it is 83% jet engine and 17% turboprop.





Airline Representation . Supervision . FBO & Operations Control Center . Flight Planning . Cargo . Tourism Agency . Aircraft Management



Şenlikköy Mah. Çatal Sk. İhlamur Evleri
No:7A/2 Florya-İST
Telefon: +90 212 574 40 10
Fax: +90 212 574 40 15
www.bilenair.com.tr
E-mail: info@bilenair.com.tr



Bijen Havacılık Ltd. Şti.

GENERAL AVIATION

Market highlights

Bombardier's Global 7500 has completed an 8,225nm (15,230km) nonstop flight, which the manufacturer bills as "the longest city-pair flown by a purpose-built business aircraft". The Canadian company is also poised to start shipping its Global 5500 and 6500, which are basically older models refreshed with new engines and cockpit technology. Bombardier launched the Learjet 75 Liberty, a light business jet.

Gulfstream has unveiled the world's largest private jet, the G700. With the tallest, widest, and longest cabin in the industry, the Gulfstream G700 is about to become the ultimate private jet. It's powered by a pair of all-new Rolls-Royce Pearl 700 engines, which give it a range of 7,500 nautical miles at Mach 0.85 or 6,400 at Mach 0.90. Gulfstream signaled that it will reveal a



Gulfstream G700

new aircraft design. The new model follows two other new planes already in service, the G500 and G600.

Pilatus Aircraft, a Swiss planemaker famous for its single-engine turboprop planes, began deliveries last year of its first jet aircraft. Additionally, Cessna just began deliveries this

month for the Longitude, its largest-ever business plane.

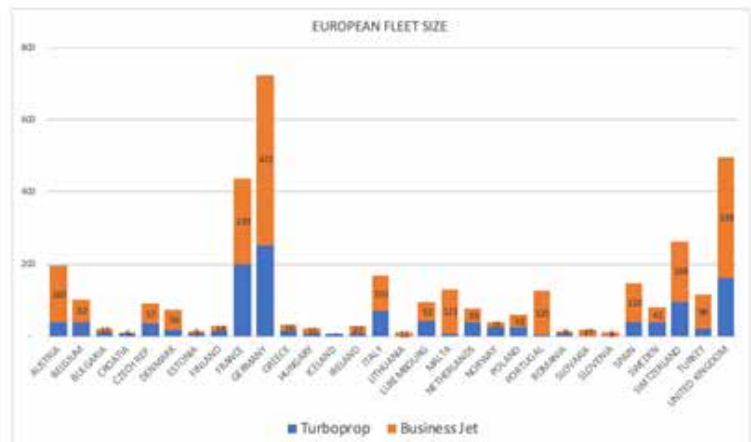
EmbraerX unveiled a new electric flying vehicle concept. The aircraft concept, with electric vertical take-off and landing capability, is part of the EmbraerX multi-project approach. The company is working on a collaborative

effort with Uber to enable and accelerate the urban mobility ecosystem.

Embraer new Praetor 600 super-mid-sized business jet was granted Type Certificate by the EASA (European Union Aviation Safety Agency) and the FAA (Federal Aviation Administration) 🇺🇸

	Turboprop	Business jet	Helicopter
AUSTRIA	38	160	236
BELGIUM	40	62	150
BULGARIA	10	12	21
CROATIA	6	6	15
CZECH REP.	35	57	284
DENMARK	19	56	117
ESTONIA	6	9	14
FINLAND	16	14	79
FRANCE	200	239	1498
GERMANY	254	472	867
GREECE	16	16	105
HUNGARY	8	13	95
ICELAND	8	-	13
IRELAND	7	22	45
ITALY	69	301	909
LITHUANIA	-	11	13
LUXEMBOURG	43	52	12
MALTA	8	123	8
NETHERLANDS	39	39	74
NORWAY	25	15	280
POLAND	26	33	214
PORTUGAL	9	125	87
ROMANIA	6	9	46
SLOVAKIA	2	17	73
SLOVENIA	1	9	32
SPAIN	39	110	542
SWEDEN	39	42	207
SWITZERLAND	96	169	347
TURKEY	20	86	76
UNITED KINGDOM	160	338	1252

Sources : GAMA 2018 annual report , EASA 2017 economic report , Turkish DGCA





Alpteknik Aviation is a Lockheed Martin International Sales Consultant for Sikorsky Helicopters in Turkey and Central Asia Countries. Alpteknik Aviation is also the Dealership for Robinson R44.

ALPJET®
HAPPY TO ANNOUNCE THAT
TC-HZR, R44
IS ABOUT TO ENTER TURKISH AVIATION INVENTORY



R66
1.000.000 FLIGHT HOURS

Robinson Helicopter Company announced the R66 Turbine fleet surpassed 1,000,000 flight hours. The R66 with the Rolls-Royce RR300 turbine engine achieved the million-hour mark without a single reported in-flight engine failure.

ROBINSON R44
WORLD'S BEST SELLING HELICOPTER

Topped the list at 209 and again ranked as the world's bestselling helicopter according to GAMA's General Aviation Aircraft Shipment 2018 Year End Report.

ALPJET is a trademark of ALPTEKNIK AVIATION with the approvals of:
SHY-145 Approved Maintenance Center For Sikorsky S76C+, S76C++, S76D and Robinson R44.
Robinson Helicopter Company Approved Maintenance Center



Turkish State Meteorological Service

Tracks and Utilizes Weather Data with an Expanding Observational Network

In this exclusive Aviation Turkey Interview, Meteorology General Manager – Volkan Mutlu Coşkun discusses the network composed of 1,867 observation systems and the 74 that are located at all airports in Turkey providing critical observation insight to the aviation sector.

 Aviation Turkey: As technology has developed significantly, can you discuss specifically how the Turkish State Meteorological Service contributes to air transport and aviation related activities?

Volkan Mutlu Coşkun: I would like to start with a metaphor; if we look at the Turkish Aviation Sector as a table with four legs, the first leg should be meteorological services and therefore the Turkish State Meteorological Service due to the fact that we provide necessary data for each plane for take-off and landing. The second leg is, of course, Turkish Airlines, Pegasus, Atlas Jet, Sun Express etc. These airlines need airports to operate so the third leg is the General Directorate of State Airports Authority (DHMI). The last but not the least leg is the Directorate General of Civil Aviation (SHGM) to regulate the sector. But now as I consider this interview

with Aviation Turkey, I need to add something to my comparison. Every table needs a vase full of nice flowers. I think Aviation Turkey will become the flowers on the table for Turkey's aviation sector.

Now I can explain our services to the aviation sector in detail. We have witnessed rapid technological improvement in the last decades. The Turkish State Meteorological Service is one of the best institutions which has adapted itself to this rapid improvement.

We currently operate a network that is composed of 1,867 observing systems. 1,636 of these networks are Automated Weather Stations (AWS), 83 of them are marine AWS, 41 of them are lightning detection stations, 18 of them are weather radars, 10 of them are radiosonde observations stations, 2 of them are dust observing stations, 2 of them are high-frequency marine radars located at the Bosphorus coast. 74 of them are located at all airports in Turkey and are devoted to providing observation to the aviation sector.

Last February we launched one of the most up to date instruments for air safety in Antalya, the Low-Level Wind Shear Alert System (LLWAS). Let me underline again my gratitude to H.E. Fuat OKTAY, Vice

President of Turkey, H.E. Bekir PAKDEMİRLİ, Minister of Agriculture and Forestry, H.E. Mevlüt ÇAVUŞOĞLU, Minister of Foreign Affairs, and H.E. Mehmet Cahit TURHAN Minister of Transport and Infrastructure for their presence in the opening ceremony of the LLWAS System at the Antalya Airport on 9 February 2019. We provide necessary meteorological support for each and every single flight in Turkey. Our offices and our services are differentiated according to the type of aerodromes but this has never changed. All flights in Turkey take off or land with meteorological support provided by the Turkish State Meteorological Service. There are two Flight Information Areas (FIR) in our country. They are located at Esenboğa Airport and Istanbul Airport. These meteorological offices monitor adverse weather activity 24/7 and produce SIGMETs for flight safety. Aviation stakeholders and users reach the MET information in the form of coded METAR and SPECI reports of weather conditions, and TAF and TREND messages for forecasting purposes.

This information is broadcast via the VOLMET system which is installed in 8 stations. When necessary, our meteorology office issues weather

warnings for parked aircraft and aerodrome operators. It is crucial to mitigate the effects of hazardous weather. The meteorological emergency committee convenes according to severity of weather phenomena and its expected impact. Also our expert teams provide en-route information and related forecasts at each airport. The Turkish State Meteorological Service has a regional training center which are accredited by the WMO. In this training center our expert teams provide courses to teach forecasting methods and other subjects related to meteorology and climate change to friendly country. Lots of meteorological resources related to aviation is free and all stakeholders may access them through the Hezarfen web page (www.hezarfen.mgm.gov.tr). Users can reach METARs, TAFs, SIGMET, GAMET and airport warnings, the web page also has numeric weather prediction outputs.

Also, our service provides UAVs and AUAVs flights with specifically developed numerical model products during cross-border operations and the fight against terrorism. Pilots are trained to use these products. In addition to that, the HELIMET application was developed for the planning and safe travel of VFR flights.

INTERVIEW



✈️ Aviation Turkey: Taking into account global meteorology practices, what would you like to say about Turkish State Meteorological Service's taking advantage of such practices, contributions and cooperation with other international meteorological organizations?

Volkan Mutlu Coşkun: The Turkish State Meteorological Service was founded on 19 February 1937 with a law signed personally by Mustafa Kemal ATATÜRK, the founder of the Turkish Republic. But the cooperation with the international meteorological community in Turkey goes far beyond 1937. As you may know, the First International

Meteorological Congress was held in 1873 in Vienna, Austria and was accepted as the institutional beginning point of international cooperation in meteorology. Turkey was represented in that Congress. After this Congress, the International Meteorological Organization was established. Ever since then, Turkey has been a solid participant, cooperating in international meteorology. Since 1937 this responsibility has been carried out by the Turkish State Meteorological Service. The Turkish State Meteorological Service is the founding member of the World Meteorological Organization (WMO) which was officially founded on 23 March

1951, and as such, each year World Meteorological Day is celebrated on the 23rd of March. The Turkish State Meteorological Service has been hosting the Regional Training Center of the WMO since 2000. We hosted more than 1,500 experts from at least 136 different countries in our training activities. Our calibration laboratories are also recognized as a Regional Instrument Center of the WMO. This means that we can provide calibration services not only to our domestic customers but also to our customers from all over the world. Because of our active participation in WMO programs, I was unanimously elected to the Executive Council of the WMO. I will represent Europe in the Executive Council for the next 4 years.

We are also a member of the European Center for Medium-Range Weather Forecasts (ECMWF) which provides necessary operational support on numerical weather prediction to members. The Turkish State Meteorological Service is also the founder member of The European Organization for the Exploitation of Meteorological Satellites (EUMETSAT). We are a member of ECOMET (Economic Interest Grouping of the National Meteorological Services

in Europe) and ALADIN (European Limited Area Numerical Weather Prediction Consortium). Nowadays we are discussing cooperation possibilities with EUMETNET executive officers. As you may know, EUMETNET is composed of different programs on observation, forecasting and climate services. We are trying to define the programs which will be beneficial for us and of course for other members of EUMETNET.

✈️ Aviation Turkey: With our country's resources and focused national vision, we've been witnessing the will of decision makers to meet requirements for technology and products that were previously obtained through direct procurement abroad. In this context, could you please share your assessments on the rate of meteorological technologies being met with national resources to minimize foreign dependency, R&D activities carried out and the support provided to these types of activities by the Turkish State Meteorological Service?

Volkan Mutlu Coşkun: As you may know, our government is implementing a program on industrial cooperation. We have taken important role in his program with X-band weather radars

and radiosonde observing systems. We are providing our companies with relevant support on their activities to develop X-band weather radars and radiosonde systems. We are also engaging in some cooperation initiatives with our universities to develop up to date observing systems. Our recent studies focus on developing domestic automated pollen observing systems. We are developing a pollen forecasting system in cooperation with Ege University. The project was implemented in İzmir as a Pilot Phase. The prototype of the automated pollen observation systems has already been developed and is being tested on our premises. We believe that in a couple of years we will buy domestically produced observation systems. On this point I would like to draw attention to the producer or the investor who would like to invest in meteorological observing systems. The market is not limited within the borders of Turkey. For instance, African meteorological services are in need of



modern observation systems, and if we test and use domestically produced observation systems we can promote these systems among other friendly countries as well.

Aviation Turkey: In what way are the Upper-Air Observations and measurement methods through the Automatic Meteorology Observation Station, Low Level Wind Shear Alert System, Mobile Radiosonde System and Balloon used in commercial and amateur aviation? Do you have plans to allow these measurements to be

incorporated and provide prompt individual access in real time?

Volkan Mutlu Coşkun: We have a very good observation network. Of course, we would like to expand the density of our network. However, if you cannot make use of the data produced by the observation network, then the density of it is not the real issue. That is why we are investing in both observational network and human resources. This year we receive a permit to employ 100 technical staff. First of all I have to underline that personal use of all our

forecast is completely free. We have a mobile application, Meteoroloji Hava Durumu. You can find it both on the Appstore and Google Play. Our application is among the top 2 applications in both platforms. You can reach real-time data of all our meteorological stations. Temperature, wind speed and direction, humidity, amount of precipitation, pressure, seawater temperature, snow depth, and all the parameters we measure as well as radar and satellite images. We charge value-added or personalized forecasts and a big amount of data from our archive. The free



INTERVIEW

data issue has always been discussed in the council meetings of the European meteorological organizations, as well. Some countries advocate free access for all types of data but we have to accept that data is one of the very important sources for our investments. In all airports we have meteorological offices and we have permanent contact with air traffic control towers. So, at the airports all of the necessary services are provided by our staff. Additionally, almost all of the observation systems could be displayed on air traffic control towers. We also support all kind of sportive activities. We deploy our technical staff with our mobile observing systems to various sportive activities.

✈️ Aviation Turkey: Recently we've witnessed negative meteorological events that have affected our country, especially in the Mediterranean region. In particular, cities with intense aerial activity and airport traffic have been more affected by these events. What would you like to say about the involvement of technology-based innovations (analysis based on big data, artificial intelligence, etc.) in meteorological applications for more precise and predictive weather forecasts in the future to minimize the

effects of such events?

Volkan Mutlu Coşkun: We witnessed a medicane (Mediterranean tropical-like cyclone) last year. Almost at the end of the summer. Last winter and this summer, we also witnessed many severe weather phenomena in Turkey. We developed an action plan on cyclone forecasting. Our disadvantage is the fact that this type of meteorological phenomena is not common in our region. But the climate is changing and now we have to adapt ourselves and we also have to help the public to understand and to adapt to this new type of severe weather phenomena. That is why an important part of the action plan is to raise the awareness of severe

weather phenomena and the importance of early warnings. Our staff will participate in the European Conference on Severe Storms this year. Also we are also striving to nurture our cooperation with different countries. For instance, currently we are working on cooperation possibilities with the Japan Meteorological Service on weather radars. On one hand we are providing training activities to developing countries and on the other hand we are developing our own capacity.

✈️ Aviation Turkey: Finally, do you have any final comments for our Aviation Turkey readers?

Volkan Mutlu Coşkun: The Aviation sector has been one of the top performing

sectors with many developments over the last decades. As the Turkish State Meteorological Service, we took part in this development by supporting every single flight in Turkey. And we are proud of this and we are proud of being a part of this brilliant development. Moreover, the Turkish State Meteorological Service is ready to provide the necessary support to the Turkish Aviation Sector. We are investing in our observation network, in our infrastructure and in our human resource capacity. Please keep following us, we are doing great things for our country and the safety of humanity.

✈️ Aviation Turkey: Thank you very much for the interview 🙏



Meteorology General Manager – Volkan Mutlu Coşkun and Ayşe Akalın - Editor in Chief of Aviation Turkey Magazine

GÖKBEY

Multirole Utility Helicopter



THE SKIES AND BEYOND

Turkish Aerospace
Subsidiary of TAAIF and an affiliate of SSB

www.turkishaerospace.com.tr

**TURKISH
AEROSPACE**





Two Big Thresholds of the Air Cargo Market



by Muhammed Yilmaz

Currently, approximately 35% of world trade value is transported by air. The next 15 years will no doubt bring developments to the industry as world GDP grows alongside human populations demanding delivery of more high value goods than ever before. With speed and reliability as air cargo's main strengths, the industry will continue to be the preferred solution for transporting time sensitive, higher value goods. However, all companies in the market have to pay attention.

Land and ship cargo transportation is as favorable and popular but are old school options for many people. As the name suggests, air freight

logistics is the transfer and shipment of goods via an air carrier, which may be charter or commercial.

This is a good choice in the

business of logistics as shipments can be sent from commercial and passenger aviation gateways to anywhere that a plane can fly and land.

Goods transported by air also have the advantage of high speed, time sensitive shipments to anywhere in the world. Air transport is also invaluable to smaller



A slowdown in global air freight markets occurred as rising fuel prices and weakening trade drove a decline in demand that began at the end of last year.

In terms of freight tons-kilometers (FTK), air freight returned to a growth pattern in March 2019 after three months of year on year declines. The industry forecast suggests that it will be 65.9m tons in 2019. And of the year, overall cargo revenues are expected to reach US\$ 116.1bn in 2019, up from US\$109.8bn in 2018.

The future is also looking bright for air freight. Estimates say that the volume of freight sent by air will increase by around 3% every year for the next decade. Recent increases in air cargo revenue and tonnage is due mainly to a boost from e-commerce, the growth of cargo services in emerging markets, and technological developments in both new

aircraft technologies and the digitization of the industry.

The rise in air cargo volumes comes as good news for air freight companies as well as for air freight forwarders who mediate business between shippers and carriers. However, a strong market doesn't mean that problems and challenges aren't brewing on the horizon.

As carriers line up to buy freighter aircraft, and belly hold capacity expands in line with passenger operations, air carriers will start to experience increased price pressure, at a growth rate of three percent per year. This means that profits made by the overall net gain in volume could be entirely negated due to competitive pricing.

Additionally, the air cargo industry is facing serious disruption through digitalization which will change the way the industry operates as a whole. New

technologies can provide invaluable resources to an industry, but their disruptive nature can also make it hard for some companies to adapt, whether it be due to cost constraints or the challenges of implementation.

So, there are two areas of change which could impact the industry and its potential profitability. These are regulation and technology. These either have the ability to throw multiple wrenches in the work for air freight or improve efficiency and cost effectiveness to the point where it becomes the method of choice for sending goods across the globe.

Shipping technology covers a wide spectrum of innovation from digitization to automation. The internet has also had a huge impact on the market and will continue to do so. Traditional players on the market who are not on board with the latest technology could

and mid-sized companies as it allows them to participate in international trade in an expeditious and effective manner. Furthermore, air freight offers the highest level of security as airport controls regulate and manage all cargo entering and leaving certain areas.

According to the IATA, cargo volumes grew by 4.1% to 63.7m tons in 2018.





find themselves overtaken by more tech savvy companies. As technology develops, so must regulation in order to keep up with new innovations and new challenges.

The future success of the air cargo industry is going to depend on stakeholders' ability, throughout the supply chain, to adapt to these changes with speed and agility, and to form strategic partnerships. The challenges ahead are otherwise too complex for any company to win on its own.

First threshold: technology impact

Technology will change the whole way that the air freight industry is run, and if companies do not adapt, they may be left out the race. Technology is transforming the market in multiple ways; from drones, the use of big data

and artificial intelligence (AI), automated systems to augmented reality (AR) and robotics. All of these, if used correctly and cohesively, have the potential to make air freight forwarding cheaper, safer, and easier.

E-commerce has been an advantage for the industry. But the speedy and efficient delivery of domestic and international shipments of e-commerce packages is still a problem. As air cargo continues to transform quicker than ever before, the industry will have to look to technology to automate processes, raise levels of data quality, facilitate information-sharing and streamline compliance requirements.

Autonomous flight in the near future

Traditional companies in the market are facing

a rise in pressure to go digital from a number of different fronts. Driverless cars and the rapid progress of unmanned air vehicle (drone) technology have opened up new possibilities for air freight forwarding. One of the most exciting innovations in this industry is the work being completed by Boeing to develop autonomous air travel. By early 2018, Boeing HorizonX had completed early stage flight tests of unmanned cargo aerial vehicles (CAV). This means that we are going to the future of autonomous flight. This research coupled with Amazon's plans for drone deliveries are an interesting development in the possible future of the air cargo market. Amazon is creating future aircraft technology to develop safe and efficient drone delivery. The delivery system is called Prime Air and when fully developed

will be able to get packages to customers in 30 minutes or less using drones (or unmanned aerial vehicles).

Many different companies are working on this technology all over the world especially in China. The Chinese Academy of Sciences modified and successfully flew an unpiloted PAC P-750 XTOL turboprop plane in 2017. Now some of the most exciting future aircraft are being developed by China. The BKZ-005 unmanned aerial vehicle was tested in this year. The self-flying planes will carry up to 1.2 tons of cargo over 745 miles at an altitude of over 16,000 feet.

China's Beihang UAS Technology established a partnership with Garuda Indonesia which will see the national airline carrier using three BKZ-005s to transport cargo in Indonesia. Plans are to eventually take delivery of 100 cargo UAVs to connect Indonesia's more remote regions that have a limited airport infrastructure. Whilst this is a relatively new idea, the digitization of the air freight market is not a new phenomenon.

Future of cargo aircraft

Belly cargo capacity in passenger aircraft increased 27% between 2010 and 2015. Boeing

says that despite this increase, freighters will continue to transport more than 50% of the world's air cargo for at least another two decades. This is due to their ability to reliably offer highly controlled transport, and their unsurpassed capacity in terms of volume, dimensions and hazardous materials. In a five-year period from 2010 to 2015, large freighters in operation increased by 8%.

Around 40% of wide body freighters are operated by express carriers to connect their door-to-door transportation network. In 2015, wide body freighters generated 40% of air

cargo industry revenue. Restrictions on the range capacity of fully loaded passenger flights as well as the number of routes serving high-demand cargo markets will continue to make freighters the cargo plane of choice for the foreseeable future.

Paperless era in the air cargo market

Like a lot of industries, air freight forwarding is starting to reduce the use of paper and printed materials. A digital approach is also more attractive to clients. It provides a cost

effective, efficient, and environmentally friendlier way to ship, as well as there is much less room for human error. Paperless air freight forwarding has multiple benefits. It's greener, for a start.

The IATA's goal is a paperless process and "smart data sharing". The arrival of apps and software for freight forwarders, that allows everything from invoicing to freight tracking to be done digitally, means that a paperless future is a possibility.

Physical paperwork is also more arduous, while user

friendly apps and software save time and energy. It also means that all of the information needed is at their fingertips wherever they are.

While some Freight Forwarding solutions have been using digital methods like e-awb for years, online registration is currently only offered by around 60% of forwarders. It's clear that in order to compete, freight forwarding companies need to go digital. However, there are no clear guidelines on how to do this, and how to roll it out to customers.

Digital is vital to the



It's Time to Grow Your Business!

Get your products reach to new markets via UPS!

Let your business grow globally while UPS makes exporting easier with the efficient logistics network in 220 countries and territories, advanced tracking technology and 470,000 employees all over the world.

www.ups.com | 0850 255 00 66

AIR CARGO

industry, but it requires a shift in thinking and in the business model to keep air freight forwarders competitive and to give customers what they want.

Emphasizing the areas in which a company already excels is a great differentiator from the competition. By complimenting that strength with digital technologies, companies will have a better chance of standing out.

Second threshold: regulation impact

IATA identifies regulations around facilitating trade as important to the future of air freight. The market needs smart regulations to support increased trade alongside safety and compliance. As the nature of air freight forwarding changes, the regulations surrounding it will need to adapt, too. Players of the market will expect greater speed, simplicity, ease, traceability, and transparency. The IATA sees regulations surrounding the industry increasing, and hopes that this regulation will be “smart, balanced, and data driven”.

One thing that hasn't changed is the prioritization of safety. New innovations must be considered, how do we

keep the general public safe if freight forwarding is automated, or if items are sent by drone?

Another important thing is that there is an even greater need for the industry to collaborate with state regulators to ensure that regulation moves with the times and does not slow down transit time.

Regulation and technology both put their own pressures on the market. So, this means that strategic choices need to be made more carefully in order to succeed. Digital must be embraced, regulation must be adhered to and collaboration must occur to ensure that this regulation does not drag businesses down. Without this, the bright future that the air freight market currently has could diminish.

Which markets lead in air cargo growth?

Air cargo traffic between the emerging markets of Asia, Africa, the Middle East and Indian subcontinent are forecasted to increase by 6% in the next 10 years, and at about 5% in the next 20. Rapid economic growth in Asia-Pacific markets will continue to lead annual air cargo growth, with China rapidly increasing its fleets of cargo planes and air freight volumes, while also growing its air route networks. The China air cargo market has demonstrated an 8.7% year-on-year increase – far above the global air cargo transport average.

Boeing predicts that China will need an additional 200 cargo planes and 470 converted freighters in order to keep up with

the next two decades of growth in the cargo industry.

The health of global air cargo charter and the global economy is largely dependent on connectivity. With China's rapidly growing economy (including their e-commerce sector), expanding middle classes and a number of new general and cargo airports in the offing, the future of the air cargo industry in China is expected to continue on a growth trajectory.

Where is Turkey in the air cargo market?

According to 2017 ICAO data, Turkey ranked 12th on the world's total paid-scheduled ton-km

Presentation of 2017 Air Transport Statistical Results

Table 6. Freight tonne-kilometres performed on scheduled services (countries and groups of countries whose airlines performed more than 25 million freight tonne-kilometres in 2017)

Country or group of countries	FREIGHT TONNE-KILOMETRES (millions)							
	Rank number in 2017	Total services (international and domestic)			Increase or decrease (%)	International services		
		2017	2016			Rank number in 2017	2017	2016
United States	1	41 592	38 658	8	1	24 727	22 441	10
China ¹	2	23 324	21 305	9	3	16 502	14 508	14
Hong Kong SAR ²		12 415	11 409	9		12 415	11 409	9
Macao SAR ³		33	29	14		33	29	14
United Arab Emirates	3	16 517	16 139	2	2	16 517	16 139	2
Republic of Korea	4	11 002	10 806	2	5	10 953	10 755	2
Qatar	5	10 970	9 206	19	4	10 970	9 206	19
Japan	6	10 685	9 361	14	6	9 700	8 412	15
Germany	7	7 391	6 943	6	7	7 362	6 933	6
Luxembourg	8	7 321	6 878	6	8	7 321	6 878	6
Singapore	9	7 007	6 696	5	9	7 007	6 696	5
Russian Federation	10	6 845	5 863	17	10	6 167	5 206	18
United Kingdom	11	5 927	5 513	7	11	5 926	5 512	7
Netherlands	12	5 698	4 746	20	12	5 698	4 746	20
Turkey	13	4 800	3 494	37	13	4 735	3 468	37
France	14	4 261	4 155	3	14	3 823	3 690	4
Canada	15	2 841	2 746	26	16	2 311	1 840	26
India	16	2 407	1 894	27	19	1 662	1 228	35
Thailand	17	2 393	2 160	11	15	2 367	2 135	11
Ethiopia	18	2 076	1 500	38	17	2 076	1 500	38
Australia	19	1 983	1 869	6	18	1 857	1 758	6
Brazil	20	1 737	1 514	15	24	1 210	1 019	19

(passenger-freight-mail) list and 8th on the international flight list on the basis of paid-scheduled ton-km. Freight transportation, which was stable between 2010 and 2013, showed a steady upward trend after 2014. While the annual freight volume in 2009 was 42.3 million tons, it was 63.7 million tons in 2018.

According to 2017 figures, considering both national and international services, the USA, China, UAE, South Korea and Qatar took place on the world's top 5 list in paid-scheduled freight-ton-km. Turkey ranked 13th on this list. In terms of international services only, the USA, UAE, China, Qatar and South Korea are the top 5 countries on the list of countries whose airlines performed the farthest freight transportation.

According to DGCA 2018 figures, the number of Turkish registered air freighters is 29. The ratio of air freighters to total 515 aircraft is 5.6%. The total freight capacity of the 29 air freighters is 2,194,450 kg. The distribution of the 29 air freighters is as follows:

- 11 Airbus A330
- 5 Boeing 777
- 5 Airbus A300-600
- 5 Boeing 747
- 3 Airbus A310

In 2015, the total freight traffic (cargo + mail + baggage) was recorded

as 3,072,831 tons; 871,327 tons in domestic flights and 2,201,504 tons in international flights, whereas in 2018, it was recorded as 3,855,231 tons in total; 886,025 tons in domestic flights and 2,969,206 tons in international flights.

It is observed that the increase in passenger traffic in our country was also reflected in total freight traffic. In 2015, the total freight traffic was recorded as 904,762 tons; 101,447 tons in domestic flights and 803,314 tons in international flights, whereas in 2018, it was recorded as 1,388,623 tons in total; 52,807 tons in domestic flights and 1,335,815 tons in international flights.

Turkey's goal: to become one of the world's top three hubs!

According to figures provided by İlker Aycı, the Chairman of Turkish Airlines, during the International Transport and Logistics Service Providers Association (UTIKAD) Summit held in October 2019, Turkey's port to port air freight market has reached US\$ 3 billion. With the addition of back services, the market value is thought to have increased to US\$ 5 billion. Turkish Cargo has the largest share of the air freight market in Turkey and has grown by

80% percent over the last three years, flying to 86 countries with its air freight fleet of 24 freighters. Having stated that Turkey rose from 7th to rank 13th in air freight worldwide, Aycı expressed that the goal was to enter into the top five first and then into the top three.

Transit market is of great importance!

The Transit cargo market is also very crucial for Turkey, because 20% of Turkish Cargo's revenue is derived

from Turkey's exports and imports, and the remaining portion is obtained from transit transports. While Turkey's foreign trade transport is expected to fall to 12% in the upcoming years, Turkey's share in the global market now is 4% and this share is intended to be increased to 7% in order to take place in the top five. Considering the fact that Turkey can reach over 60 capitals via just a 7-hour flight from Istanbul and has 40% of the market, it is as simple as a pie for Turkey to get a bigger slice and play a far greater role in the air cargo market in the future 🍷





Global Air Cargo and Turkish Cargo

by Turhan Özen – Chief Cargo Officer at Turkish Airlines

The global air cargo industry keeps growing and evolving into new dimensions with the effect of the developing technology. According to IATA data the industry demonstrated growth that is considered regular in terms of tonnage between 2009 - 2018, and it is expected to take a substantial share of global trade operations in

the upcoming period. The air cargo industry accounts for 1% and 38% of global trade operations in volume and value, respectively.

In line with the World Air Cargo Forecast; the global air cargo industry and the global cargo fleet are expected to grow by 4.2 percent and by more than 75 percent on annual basis between 2018-2037.

We see that substantial developments and a positive acceleration are occurring in Turkey in parallel with global air cargo developments and trends. The data obtained by Eurocontrol shows that the quantity of cargo carried in Turkey between 2009-2018 has increased by 232 percent.

We, as Turkish Cargo, are

maintaining our dynamic growth across the air cargo industry in strict adherence to developing technology and global norms. According to the data disclosed in July by the WACD immediately after we moved into the Mega Hub Istanbul Airport, we have increased our tonnage rate by 11.7 percent while the overall industry has shrunk by



© Turkish Cargo



© Turkish Cargo



-4.2 percent, and we ranked 7th in the air cargo market. (In July 2018, we ranked 8th.)

Increasing our tonnage figures, growing our fleet and flight network

We carried 1.4 million tons of air cargo in 2018 leveraging our services extended to 126 countries around the world, and in 2019 once we have moved into the mega Istanbul Airport we aim to handle/carry 1.6 million tons of air cargo. We will be providing service to more than 300 destinations around the world including 88 direct cargo destinations thanks to our fleet of 344 aircraft including 23 freighters and the 5

newly-acquired Boeing 777 aircraft each equipped with a capacity of carrying 102 tons of cargo. Turkish Cargo aims to extend its current flight network and operate flights to 10 more destinations across the continents of Africa, Asia, Europe, South and North America. We will have access to more than 120 direct cargo destinations by 2023, marking the 100th anniversary of the establishment of the Republic of Turkey.

Special cargo service for special products

Turkish Cargo provides service with 43 specialized cargo containers with different contents and temperature ranges. Special solutions such as

"TK Live" for a comfortable travel experience, "TK Care" for highly sensitive consignments to be carried and accompanied by expert teams, "TK Fresh" for consignments that require transport at appropriate temperatures to stay as fresh as the day they were produced, "TK Valuable and TK Vulnerable" for highly-protected storage and transportation, "TH Pharma" for medicinal products and "TK Courier" for fast and privileged consignments. We perform transportation operations to any destination around the world by preserving the same temperature ranges required by our clients thanks to our thermal temperature controlled, CSafe RKN and Envirotainer containers.

Istanbul Airport and Mega HUB Cargo Terminal (SmartIST)

With air cargo operations across more than 300 global destinations, Turkish Cargo will have an annual handling capacity of 4 million tons of cargo at its mega facility to be built on a total area of 300 thousand m2 at Istanbul Airport. Accessing more than 60 capital cities in a flight period of 7 hours, Istanbul Airport is one of the closest hubs to global logistics centers. To be completed in two different phases, the facility that is being constructed will be equipped with IT developments and optimization, robotics automatic storage

PROFILE

systems (ASRS-PCHS), as well as the special cargo services PER - AVI and Express - E-commerce operational areas.

We'll keep performing our operations by means of our technology-assisted services such as the inter-communication of all systems and operations thanks to lot & Big Data, enhancement of the operational efficiency thanks to UGV&UAV, gaining area and minimization of human-oriented operations, shift to digital processes from paper-based processes thanks to E-Freight, and minimization of error rates and costs thanks to RPA.

Additionally, as part of the services of "We World Express", a Hong-Kong based associated company incorporated jointly with ZTO, the Chinese express cargo brand, and Hong-Kong based PAL Air, door-to-door logistics operations, pick-up, transportation, pick-up from home, distribution, freight transportation, pick-up from home and distribution, freight transportation, cross-shipment and transportation to last point, will be provided. It if required storage management, order and supply chain management services will also be provided.

Combining its extensive service network and



operational capabilities with Turkey's unique geographical advantages, Turkish Cargo maintains its operations with the aim of being one of the top five global air cargo brands in line with the vision set for 2023.

Logistics and training

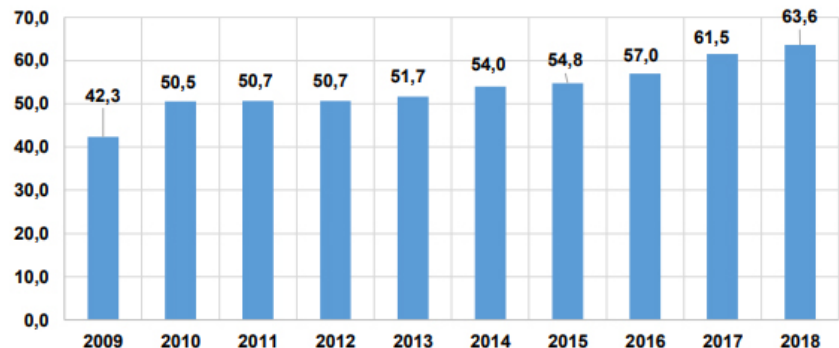
Turkey is forging ahead to become a global logistics base especially among the continents of Europe, Asia and Africa the need for related qualified manpower

increases each and every day. Team members who have received theoretical and practical training on minimizing costs/ expenses and efficiency enhancement are essential assets. Key fundamentals also include the planning of fast, flexible and effective supply chain management processes, and insight into the improvement of production and distribution systems.

Turkish Airlines has started the implementation of "TK Take Off" which is a program facilitating the

initial processes of a new graduate's business life. This capability program enables university students to take their first confident steps forward in their new jobs. The airline also provides extensive internship opportunities and continues to support education and training which paves the way for young minds and opens doors to the competitive, fast-growing and entertaining aviation industry that spans the globe with endless possibilities ➡

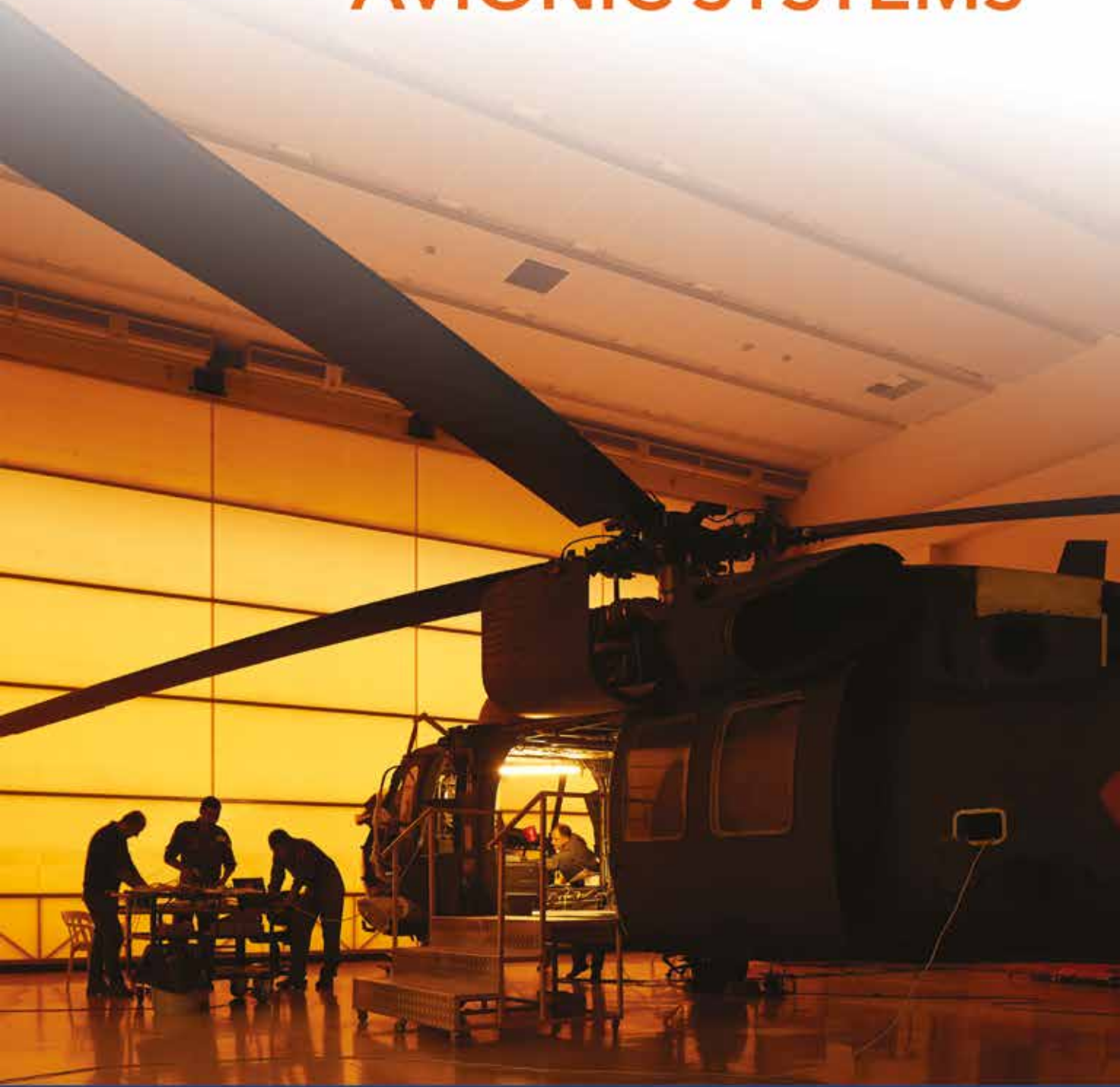
(GLOBAL CARGO TRAFFIC BETWEEN 2009-2018 (MILLION TONS))



*Global Cargo Traffic between 2009-2018 (Source: ICAO/Statista)

*Press Release issued by IATA on 07.02.2019

Proven Technology
AVIONIC SYSTEMS



www.aselsan.com.tr

aselsan



ASELSAN is a Turkish Armed Forces Foundation company.

Istanbul Airport Cargo City

Construction of Cargo City was started in 2016. A master plan was prepared by IGA in line with necessities of the players in the cargo industry such as customs authorities, air cargo carriers, freight forwarders, ground handlers and cargo transportation companies etc. Upon sharing the master plan with all players, leasing contracts were signed and construction projects were collected from each tenant together with termination plans. Additionally, we controlled all the constructions as well as operating plans and have successfully reached the opening stage.

Situated only five hours of flight away from the Europe, Middle East, Central Asia, North and East Europe, Turkey's geographical position attributes a strategic significance to cargo and logistics operations. Because of its strategic geographical position, the investments of the national and international companies has been steadily increasing in Turkey; thus, the goal of the Istanbul Airport is to

become one of the largest cargo hubs worldwide and contribute to Turkish economy.

The Cargo City within Istanbul Airport covers an area of 1.4 million square meters.

The Cargo City consists of several, significant national and international companies, which offer cargo, logistics and temporary storage.

Capacity upon completion of ongoing construction is 15 million tonnes. By the end of 2020 it will be 4,5 million tonnes. It will reach 5.5 million tonnes by 2028. The parking positions of the centre, which can be docked by over 29 wide-bodied cargo aircraft at the same time, are located just in front of the warehouses. The efficient and effective operation infrastructure facilitates the access from these locations to the passenger terminals and remote parking stands. The functionality of the structure which passes beneath the runways and taxiways through the service tunnels at the airside without being disrupted by the aircraft traffic is praiseworthy.



Situated between 2 runways, Cargo City is located in the aerodrome to facilitate the access of freighters. Its location also enhances accessibility of aircrafts to cargo terminal by generating the shortest possible turnaround time. The fact that it is connected to Istanbul city road system by tunnels through which loading and unloading trucks can easily access to cargo terminal area provides easy movement between landside and airside. Efficient infrastructure greatly facilitates the cargo handling process because air cargo

carriers have their own aircraft parking spaces in front of the warehouses.

The Cargo City within the New Airport will house all warehouses, cold chain storages, valuable and vulnerable storages, agency offices, customs offices and all cargo/logistics operations. The As per these advantages, we expect new cargo companies in our cargo terminal.

With the completion of the 4th runway, we will have a new cargo terminal between 3rd and 4th runways



TRAINING AND SIMULATION TECHNOLOGIES

Training Centers, Training Systems, Civil Aviation Solutions, Training Services, Training Solutions/Products, Integrated Logistics Support Services.
For details, please visit our website.






© myTechnic

Excellence in Maintenance myTECHNIC has touched the lives of over 240 million passengers

In this interview Mr. Hüseyin Oflaz, General Manager of myTECHNIC shares insight into the company's plans to motivate and generate future aircraft maintenance technicians. Since its establishment myTECHNIC has maintained nearly 1,200 aircraft and engines, nearly 150 different airlines from more than 50 countries.


 Aviation Turkey: Mr. Hüseyin Oflaz, first of all thank you very much for taking the time for this interview. As the first private enterprise within the Sabiha Gökçen Airport and as an aircraft maintenance center that was designed with a lean concept which was functional within 18 months and which is also a holder of Aviation Week's world award in 2009, could you please summarize the history of your company since your establishment?

Hüseyin Oflaz: I would like to thank you for this interview that is to be published in Aviation Turkey Magazine. I think your magazine has played an important role in communicating the importance of Turkish Civil Aviation around the world; within this context I really appreciate your efforts and I sincerely wish you success.

We celebrated our 10th anniversary last year, and from the very beginning we trusted our country, our people and our technical know-how. We struggled against difficulties in this way and we worked hard. Today myTECHNIC is an aircraft maintenance center authorized by civil aviation authorities of more than 40 countries from China to Europe, from Africa to Russia and in the Central Asia. Since our establishment, we have maintained nearly

1,200 aircraft and engines of nearly 150 different airlines from more than 50 countries. A passenger aircraft carries an average of 200,000 passengers per year, and maintenance of 1,200 aircraft corresponds to a total of 240 million passengers; hence we are fully aware of our responsibility.

Following the 12 years since our establishment, myTECHNIC has become a brand known worldwide in the sector. myTECHNIC has become a preferred maintenance center not only by our customers i.e. airlines, but also by employees. Today, the number of our employees has reached 700.

 Aviation Turkey: myTECHNIC is one of the exceptional aircraft maintenance centers that can perform maintenance and repair activities on the basis of aircraft, engine and components, paint platforms and provide certified type training related to the field of activity under the same roof. If you consider the strategic importance of this integrated structure in our region, where over five thousand aircraft can be reached with a sortie flight, what could you say about the effect of it on your commercial activities?

Hüseyin Oflaz: Our country is situated in the north of the equator and east

INTERVIEW

of Greenwich. With this location, our country is at the important crossroads connecting the continents of Asia, Europe and Africa. It is at the center of both developed and developing countries. Therefore, it is possible to see the world's largest and dynamic aircraft fleets within a circle to be drawn considering the flight range of the aircraft that we serve and Turkey is located at the center of this circle. In short, due to our geographical position in the world, we have reached the level of an economic solution center for the airlines and it is inevitable that this level will continue to strengthen. This outcome as a result of strong will and continuous executive follow-up as a company should not be a surprise. Without doubt, in addition to our corporate efforts, our country's significant investments in aviation through the construction of the new Istanbul Airport and Sabiha Gökçen's 2nd runway should not be overlooked. Turkey and myTECHNIC

have greatly made use of this critical opportunity both in the world and within the geography and we have become an effective player in the region in terms of aircraft maintenance.

Aviation Turkey: What is myTECHNIC's market share in the national and international arena and your assessment regarding its development?

Hüseyin Oflaz: Considering that the total aircraft maintenance market in the world (hull maintenance + engine maintenance + component maintenance) is about US\$ 65 billion, it is clear there is a long way ahead. However, we can easily say that myTECHNIC has become one of the best known and powerful maintenance centers in the region with its investments in its workshops and new aircraft type authorizations in order to become a multi-solution center at one point.

Aviation Turkey: Mr. Oflaz, what are myTECHNIC's primary distinctive features and



capabilities that make it the center of attention of both foreign investors and foreign customers? Could you please share your assessments with us?

Hüseyin Oflaz: In determining the principles of doing business, myTECHNIC is customer-centric and behaves according to customer needs. Caring about the problems of our customers is our sine qua non.

In addition to our customer-driven approach, the

features noted below are what make myTECHNIC distinctive amongst its competitors:

- multi-storey hangar building design and its advantages
- ability to perform hull maintenance for 12 medium and large hull aircraft at the same time
- being the largest independent aircraft maintenance center and the flexibility, it provides to its customers
- ability to paint for return aircraft
- having an engine workshop



INTERVIEW



© myTechnic

- increases the number of workshops for other component maintenance except for the engine
- high quality and economic maintenance completed in a short time
- When we add the strategic position of our country to all of our corporate capabilities, being preferred becomes inevitable

Aviation Turkey: myTECHNIC is also one of the few maintenance centers that develops and uses the computer aided management information system covering all of its

activities under the brand flyANT. What would you like to say about your efforts and collaborations regarding offering this product to different customers and the use of it as a preferred product on the global market?

Hüseyin Oflaz: FlyAnt Maintenance, Repair and Overhaul (MRO) Decision Support software was developed by myTECHNIC. The audits and practical business practices of myTECHNIC were integrated in it. Now we

are improving our software with new technologies and making it more compact, more mobile and smarter. While our main goal here is to create a higher value for myTECHNIC, it is our greatest wish to create value elsewhere with such a product. In this context, we sold basic previous versions of FlyAnt in the past. In addition to myTECHNIC, it is used in line maintenance and planned maintenance applications. Of course, it is not sufficient and we have a very intense experience especially in the maintenance management part of aviation and we believe that our software can be positioned and used in addition to the aviation field. To this end, while developing our new software, we gather with all parties from inside and outside the sector and obtain their opinions, and we add ideas and demands that are applicable and will create added value. We are confident that the product will make a difference and be demanded.

Aviation Turkey: Could you please inform us about your R&D and Product Development activities related to myTECHNIC's aircraft maintenance processes?

Hüseyin Oflaz: Within the sector, myTECHNIC is known for its ability to develop solutions that meet its needs in itself. We are continuing our R&D activities as an R&D Center which was registered in October 2018. Our goal is to ensure that our customers receive value-added services from us at low costs while ensuring that the foreign exchange input that we produce remains within the country. We focus especially on artificial intelligence, autonomous vehicles, RFID solutions, ground support equipment and test systems. Aviation has always proceeded ahead of other sectors in terms of technology and continues to do so. We cooperate on adapting the knowhow and experience gained in aviation to other sectors, and incorporate




© myTechnic



© myTechnic

INTERVIEW

best practices that we have learned from them to improve efficiency and quality.

 **Aviation Turkey:** In previous years, myTECHNIC successfully collaborated with employment agencies (such as İŞKUR) and educational institutions (such as the Cappadocia Vocational School) in order to establish its own workforce. You also had an approach of offering the experience gained in these collaborations to the global market with the myACADEMY brand. Do you have similar activities and projects both in basic and type vocational training at present?

Hüseyin Oflaz: One of the most important bottlenecks in the aviation sector is the lack of qualified aircraft maintenance technicians. This fact, from the past to the present, seems to be more effectual in the following years. Considering that the sector grows over 3% in the world every year and over 10% in our country, the big picture can be perceived more clearly.

Officials of an important European maintenance center recently came to Istanbul and opened an office and made great efforts to transfer technicians from the market. Even this single situation is sufficient to understand how common and vital this need is.

Even though myTECHNIC has been carrying out various activities to meet this need from time to time, it is for sure that the most important and permanent step we have taken so far was the structuring of myACADEMY. One of the important approaches behind this activity is to provide technical support and to investment in vocational technical high schools that train technicians. Firstly, it appears that the trainers' completion of technical and practical training is a sine qua non. Carrying out the necessary activities to this end, revising the school education materials and documents, and renewing the workshops where the students do practical work in order to meet the current needs appropriate to the purpose will provide important gains to the sector. In addition, the students' doing their summer and winter internships in the hangar or company workshops and working together with professional technicians who have a mission to prepare such students for the profession will provide important experiences for their future professional lives. Support given to successful students by aircraft maintenance companies during their education period through the scholarship constitutes the technical, social and psychological dimension of the subject.


With a 5-year protocol signed between myTECHNIC and the Ministry of National Education, myTECHNIC has started to provide the necessary theoretical and practical training to 13 teachers of public high schools that have aircraft maintenance areas in our country. The 104-hour basic training course was given to 72 aircraft maintenance area teachers at the facilities of the Cappadocia University in June and July 2019. The activities are ongoing to this end.

Furthermore, the activities that contribute to education, provide internships and scholarships to the students of Sabiha Gökçen Vocational and Technical Anatolian High School, which is appointed as a pilot school by the Ministry, will continue during this 5-year period.


Our other field of activity is the cooperation we started with the Cappadocia University. We plan to provide trainer support and invest in training sets, apparatus, materials and consumables in the workshops of Cappadocia University, which also train aircraft maintenance technicians in the B1 and B2 categories. Students will participate in the activities in our company hangar for their practical studies within the scope


of regulations. Related activities are ongoing with the university in full consensus. At the beginning of 2020, workshops are planned to be opened with new equipment.

As I mentioned before, the most important aspect of this effort is the fact that students will have the opportunity to train within the sector become qualified and highly competent technicians. Expansion of similar efforts which we have initiated as a company seems to be the most truthful and reliable method for overcoming the bottleneck encountered in the sector.

 **Aviation Turkey:** myTECHNIC is at the same time one of the first industrial investments of China to Turkey. What would you like to say about the businesses developed by the capital owner, HNA Group, in Turkey in addition to this investment?

Hüseyin Oflaz: The investment made by HNA Group in our country is currently only myTECHNIC.

 **Aviation Turkey:** Mr. Oflaz, would you like to convey any message for Aviation Turkey readers?

Hüseyin Oflaz: We appreciate and support Aviation Turkey magazine. I expect the same from the readers of the magazine 

nurus

Design, functionality and comfort at Istanbul Airport

Awarded by German Design 2018, Eon Terminal turns your journey into a comfortable and functional experience at the Istanbul Airport one of the largest airports in the world.

Eon Terminal
Designed by Nurus D Lab



nuruslinks

NURUS LINKS, connects your electronic devices to the furniture offering a variety of solutions for VGA, HDMI, Plugs, USB adaptors, USB charges, Data inputs and interrupters.

nurus.com

World's Largest Airport Welcomes Passengers with Eon Terminal Seats



Istanbul Airport, operated by IGA, is planning to increase passenger capacity to 200 million passengers annually and hosting flights to more than 350 destinations once fully complete in 2025. This means that functional and comfortable areas are required in order to provide the best experience for passengers in a place with intense passenger traffic. At this point, Nurus with over 90 years' experience in furniture solutions has provided not only terminal seats for Istanbul Airport but also solutions for waiting lounges, air traffic control tower, offices and common areas.

A Unique experience

Nurus has distinguished itself from its competitors worldwide which produce airport seats and has signed an agreement with IGA to cater to passenger needs today and in the

future. To date, Nurus has delivered over 26,000 Eon Terminal seats to Istanbul Airport. The **Eon Terminal** product is manufactured at Nurus' own production facility in Ankara which is equipped with advanced machinery and the latest production techniques. A separate production line was installed, and all the seats were produced within 3 months. To meet the needs of the age of technology, Nurus Links® connection points which

include plugs and USB ports are integrated to the coffee tables and in between the seats of Eon. Therefore, it allows you to charge your devices, use your laptop or watch a movie while waiting.

The Eon Terminal seat, which is a German Design Award winner, is manufactured to be robust and long-lasting to withstand many years of daily use by thousands of passengers. Eon Terminal is ergonomically designed

and produced from a single piece of polyurethane which provides comfort by its flexible structure and inclined backrest. The gap between the seat and the backrest is designed to make cleaning easier, to help with security checks and to allow visibility to be able reach any dropped belongings of passengers. Eon allows you to form any needed configuration with its adjustable seat, table and armrest arrangements.



Additionally, there is a need for relaxing areas for transit passengers, those whose flight was delayed and those who must wait during long lay overs at the airport. Therefore, Nurus designed and produced Eon Recliner seats to help passengers relax before take-off.

Special furniture for technical spaces

Nurus Design Lab designed and developed special console tables for the Istanbul International Airport Traffic Control Tower according to needs and expectations of air traffic controllers. The adjustable-height console has angular moving monitor arms to allow the user to adjust the screen according to the reflection of the sun. Furniture pieces found in the Security Operation Center and the Airport Operation Control Center also produced by Nurus as well.

Waiting is no longer boring

Unifree Duty Free and its partner Gebr. Heinemann operates a 53,000 sqm



retail space at Istanbul Airport. Aiming to provide a complete experience to its customers, the Unifree Duty Free waiting areas are furnished with **Loca** and **Pinto** from Nurus. The modular design of the Loca and Pinto allows the product to be used in various configurations. By bringing convex, concave or flat forms side by side, it is possible to create different seating areas. On the other hand, if the capacity of the seating needs to increase due to passenger traffic, it is possible to do so by adding new units.

New offices for the new airport

In addition to relaxing waiting lounges, Unifree's offices, where approximately 2,000 people will work, are located in a total area of

100,000 square meters in different zones at the Istanbul Airport and all the furniture needs of Unifree employees have been met with Nurus products. Work zones, meeting zones and social zones are specifically designed to create a modern work environment.

Ahead of the curve

Nurus successfully completed many domestic & international terminal projects such

as Istanbul Airport, Kuwait International Airport, Ghana Kotoka Airport, Sabiha Gökçen Airport, Saint Petersburg Pulkovo Airport, Bahrain International Airport, Ashgabat Int. Airport, Turkmenbashi Int. Airport, Bodrum Airport, Izmir Adnan Menderes Airport, Zafer Airport, Antalya Airport, Atatürk Airport, King Khalid Airport and Alexander The Great (Skopje) Airport, which all include a wide range of Nurus products ➔





Digital Transformation Quickens Pegasus's Competitive Advantage

In this exclusive interview Güliz Öztürk, Chief Commercial Officer – Pegasus Airlines discusses how the company is focusing on technology as a driver for sustainable growth, profitability and guest experience, channelling investment and innovation into every aspect of business operations. The A321 aircraft will be a game changer for Pegasus. In the coming year, the switch to these new and more fuel-efficient aircraft will keep costs low. With the youngest fleet in Turkey and one of the youngest in Europe among LCCs, Pegasus has benchmarked six new tech pillars with other airlines. Progressing towards this vision the company is engaged in projects focused on using innovative technology to grow and to improve the overall travel experience. Güliz Öztürk also discusses a variety of successful industry 'firsts' such as the implementation of New Generation Kiosks that offer will provide autonomous improvements, as well as a project that will allow 'paperless' flight, departing from Sabiha Gökçen Airport by the end of 2019

✈️ Aviation Turkey: First of all, as a role model that has been serving in the aviation sector for many years, contributing to the development of gender balance in aviation, what would you like to say, within the framework of your experience, on the formation of Pegasus Airlines and its development over the years particularly together with the liberalization efforts encountered in aviation at the beginning of the millennium?

Güliz Öztürk: Pegasus Airlines was the first airline to launch a full low-cost model service in Turkey, revolutionising Turkey's airline sector. Our scheduled services were founded in 2005 with the belief that 'everyone has the right to fly', with an affordable pricing strategy reflecting this motto to democratize and transform travel in Turkey and far beyond.

Since then we have established ourselves as Turkey's leading low-cost airline and one of the region's frontrunners since the liberalization of the skies at the beginning of the millennium. We continue to offer affordable flights while keeping the quality of our service high through continued investment in our new fleet and state-of-the-art technology and providing a wide range of excellent connections and personalized services.

Throughout our growth, promoting gender balance



has been important to us as aviation is still a predominantly male-dominated industry. We have been working to do our part to redress this imbalance, with a high ratio of women across every segment of our business.

Moreover, our growth has been marked with many milestones significant not only for us as a company but for the industry and Turkey as a whole. In 2012, we made the single largest-ever aircraft order in Turkish civil aviation history at the time of approximately US\$12 billion (list price) for 100 new Airbus aircraft. We pioneered the use of Sabiha Gökçen Airport as our hub in Istanbul by transforming it into a primary hub offering fantastic links to the Asian side of Istanbul and nearby

catchment area. In fact, we created a completely new catchment zone around Sabiha Gökçen Airport, straddling two continents.

More recently, in 2018, we launched our new digital transformation program, to power Pegasus into the future and to secure a competitive advantage with technology as a driver for sustainable growth, profitability and guest experience. We are channelling investment and innovation into every aspect of our business operations as well to constantly keep improving the guest travel experience at every level from A – Z.

We currently have a growing network of 111 destinations, including 35 in Turkey and 76 other international destinations in 42 countries

across Europe, Russia and the Caucasus, the Middle East, North Africa and Asia. Our expansion in the region continues.

✈️ Aviation Turkey: Pegasus Airlines ended 2018 successfully by increasing its turnover by 55% compared to the previous year. Within this context, can you evaluate 2018's results for us according to the number of passengers, profitability and other financial targets as well as realized figures?

Güliz Öztürk: Despite challenging conditions, 2018 was another record year for us with improvement in every key metric. We carried 30 million guests on our domestic and international routes equating to a year on year growth of 8%. Despite increasing capacity, we also





grew our load factors 1pp to reach 85%.

As you mentioned, our revenue increased by 55% to TRY8.3 billion in 2018, and despite rising fuel costs, we managed to maintain our profitability with an annual net profit of TRY507 million for 2018.

Passenger yields also improved year-on-year both on domestic and international routes, with domestic up 21% year-on-year to TRY100.8 million.

Pegasus' EBITDAR also increased by 57% to 2,050 TRYmn in 2018 with the margin up 0.3pp to 24.7%. Additionally, we achieved an historic record for our annual ancillary revenue per passenger, up 18% to reach €11.9 in 2018, with this upward trend continuing this year.

Aviation Turkey: As stated in your report, CASK (Cost per Available Seat Kilometers) 2018 was better than your CASK target, excluding the fuel. What would you like to say about this achievement obtained in 2018?

Güliz Öztürk: We achieved a flat CASK in 2018 FY

despite the price of oil and FX headwinds. Our EUR CASK non-fuel was down by 8% to 2.34 EURc which was a great success positioning us as having the 3rd lowest CASK in Europe (excluding fuel). Some of the reasons for this success include increasing our average daily aircraft utilization to 12.6 hours in 2018 from 12.1 hours in 2017; optimizing the fleet through the sale of B737-800 and increasing the share of A320 NEOs which provide up to 15% greater fuel efficiency; together with a management focus on cost efficiencies throughout the business via the '4C' strategy (Cask, Cash, Capacity and Customer).

Aviation Turkey: What would you like to say for 2019 Q3 in terms of turnover, profitability and other financial targets as well as the number of passengers?

Güliz Öztürk: According to our current projections for 2019, we anticipate a 6%-8% year on year capacity increase (ASK) by the end of the year. By year's end our domestic yield is expected to show an annual increase by 25-30 TRY and our international

yield, an annual increase of 1-2 Euros. Thus, the outlook for Q3 2019 is still projected as upward growth.

In 2018, one of our most notable achievements was our historic record for annual ancillary revenue per passenger (up 18% to €11.9) and continuing on this upward trend, we anticipate that for the full year 2019 our ancillary revenue per passenger will reach 13-14 Euros.

Aviation Turkey: Pegasus Airlines flies to 111 destinations in 42 countries. What will new lines will be initiated in the upcoming period? How will these new lines affect competitiveness in the "low-cost airlines" market? Could you please inform us about the current status and developments within this context?

Güliz Öztürk: Today, we fly to 111 destinations, including 35 in Turkey and 76 on international networks in 42 countries across Europe, Russia and the Caucasus, the Middle East, North Africa and Asia. So far in 2019, we added eight new international routes: namely Baku (from Izmir), Basra, Casablanca, Eindhoven,

Manchester, Riyadh, Venice and Ras al-Khaimah (from 30 October 2019).

Our biggest source of growth is the new markets that we are penetrating in Russia, the Middle East, North Africa, the Caucasus and Eastern Europe where LCC penetration is still low, where there are more flexible visa regulations and geographical and cultural closeness.

To expand our network, our focus is to increase frequencies and to add new destinations in these regions next year and beyond with our growing fleet of new aircraft as fast as we can obtain traffic rights from the Civil Aviation Authority. Our long-term ambitions are to continue to grow across our network including boosting point-to-point flights between regional cities as our position as a leading network low-cost carrier strengthens.

We will also continue to develop international airline agreements. We currently operate eight partnerships including our new agreement with Emirates; in addition, with



S7 Airlines, Nile Air, KLM Royal Dutch Airlines, Flynas, Alitalia, Qatar Airways and Delta Air Lines.

Aviation Turkey: Pegasus Airlines continues to renew its fleet with the inclusion of new A320 Neo aircraft. Could you please inform us on the current fleet status and the new aircraft that will join the fleet?

Güliz Öztürk: We are transforming our fleet and currently have the youngest fleet in Turkey and one of the youngest in Europe among LCCs with an average of 5.2 years as of August 2019.

Powered by our 100-strong order of next-generation Airbus aircraft (which was the largest order of aircraft in Turkish civil aviation history at the time in 2012), our 83-strong fleet is currently comprised of 39 Boeing B737-800s, one Boeing B737-400, 12 Airbus A320-200ceos and 31 Airbus A320neos.

As of August 2019, we have received all nine Airbus A320neo aircraft due to be delivered this year and we took delivery of our first

of our new Airbus A321neo aircraft on 11th September 2019 and the second in the last quarter of this year. The A321 aircraft will be a game changer for us as they seat up to 239 guests.

In the coming year, we will be continuing our switch to these new and more fuel-efficient aircraft which help us to keep our costs low for our guests. Nine Boeing B737-800s will be decommissioned in 2019. 20 A320neo aircraft will join the fleet and six Boeing 737-800s will be decommissioned by the end of 2020 according to our original fleet plan.

Aviation Turkey: Increasing fuel costs have a negative effect on airfares and profitability. What are the policies of Pegasus Airlines towards cost-effectiveness and high profitability? What efforts are being focused upon for the positive reflection of these strategies on airfares?

Güliz Öztürk: Increasing the efficiency of our operations is of course a major concern for us, especially

considering rising fuel costs and currency fluctuations. As you are aware, we are gradually transforming our fleet to Airbus. One of the major benefits of these new aircraft is their efficiency as they are powered by the more environmentally friendly CFM Leap-1A engine. Not only do these engines reduce fuel per seat mile costs by 15% compared to their counterparts, they emit less CO2 and are also quieter.

The past few years have also demonstrated our focus on our 4Cs strategy for cost-effectiveness: Cask, Cash, Capacity and Customer. By reducing CASK in various ways such as renegotiating supplier contracts and optimising labor and marketing and simplifying processes we are achieving the best possible cash management and utilizing capacity as efficiently as possible by delaying aircraft deliveries, wet leasing and selling aircraft. Having said this, the biggest driver to our success in capacity management, was our “international

switch strategy”, where we have grown our international network in double-digit numbers, starting from mid-2018 and continuing in 2019.

Since launching our digital transformation program in 2018, this is also a major focus for us, both in terms of cost efficiencies and improving our guests’ travel experience from the beginning to the end.

The costs we save and increased efficiencies we achieve through the combination of such policies are transferred to our guests through lower airfares and better deals on travel services.

Aviation Turkey: “Technology” and “Digitalization” concepts have been used more often recently in aviation. Within this context, Pegasus Airlines has positioned itself as “Turkey’s Digital Airline”. What studies have been conducted in the field of digital transformation and please touch on your future vision in this field? What advantages do these efforts provide to Pegasus Airlines customers? How would

INTERVIEW

you evaluate the efforts of Pegasus Airlines in this field when compared with global companies?

Güliz Öztürk: Our mission is to become one of the world's top three airlines in terms of technology and leading the sector as 'Turkey's Digital Airline'. We have set three new focus areas: Alignment, Disruption and Big Data, and identified and benchmarked six new tech pillars with other airlines. Progressing towards this vision, we have developed a huge number of current and future projects that utilize technology to grow and to improve the travel experience of our guests, as well as projects that generate efficiencies for our internal stakeholders – both our employees and shareholders.

Some of our key projects which include some 'world firsts' are the Express Baggage and New Generation Kiosks, meaning our guests who have checked-in online can drop off their bags more quickly. We have been the first airline to launch this service for domestic routes in Turkey and the first airline to launch it at Sabiha Gokcen Airport, thus offering our guests a faster, practical and seamless journey from ticket sale to the delivery of bags. Our Express Baggage service allows our guests to tag up to 2 bags each that are within the weight limit of their purchased ticket and send them directly to the aircraft.

We have also implemented New Generation Kiosks in July 2019 that offer passport scanning technology, to check in and label luggage and purchase additional baggage allowance, using new generation payment systems. The improved Express Baggage units will provide autonomous improvements that will allow the passenger to use the "drop and go" feature. This is the first bag-drop unit in the world to operate in this way.


From February 2019, we have begun to test Travel Technology using the New chip ID card on Turkish routes at gate 208B, in a joint project with Istanbul Sabiha Gökçen – those with the new Turkish ID card who have completed their online check-in for domestic routes can directly board flights without a boarding card. This project is a global first, and we plan to implement it on all domestic flights departing from Sabiha Gökçen Airport by the end of 2019, allowing our guests to fly "paperless".

We also use the latest mobile technologies in our operations to increase efficiency and boost employee satisfaction. Since 2016 we've had a paperless cockpit via our Electronic Flight Bag Project. We've introduced some new programs such as the PiN (Pegasus Intranet), where all personnel can manage and receive daily



requests, SmartCabin that facilitates the job of the cabin crews and SmartOps which enables pilots to manage their operational processes efficiently and on-time.

These are just some examples of how we've been using technology to improve the experience of both our internal and external stakeholders.

 Aviation Turkey: We know that Pegasus Airlines places great importance on pilot training and executes a "Pegasus Pilot Training Program". What are the details of your studies and programs regarding pilot training? How many new pilots do you plan to recruit in the coming period?

Güliz Öztürk: As we continue our growth in parallel with the increasing size of our fleet and rising market demand, we have an increasing need for raising

and integrating qualified people into our cockpit teams. In June 2019, we announced that we are looking to hire 150 new pilots to join our cabin crew.

To inspire the next generation, we are enrolling young people who have grown up with the dream of becoming a pilot into our Pegasus Pilot Training Program, currently only available for the citizens of Turkey.

We offer our cockpit team the chance to work part-time, and receive European-level salaries, substantial benefits and continuous opportunities for self-development through training that focuses on safety and quality. We also offer the Commander Upgrade to First Officers with sufficient experience, Self-Type Rating training for candidates with experience in different types of aircraft, Type Rating



INTERVIEW

and Line Training with guaranteed employment to inexperienced candidates.

While building cockpit teams, we are actively seeking to create equal opportunities for all pilots and pilot candidates regardless of gender or race. We actively encourage more female pilots to join our cockpit crew as well as attracting international talent and at the start of this year, we opened our cockpit team for applications from Expat Pilots.

Aviation Turkey: Does Pegasus Airlines have a plan to open a Pilot Training Academy to meet both its own needs and that of global pilots as well?

Güliz Öztürk: We have an agreement with flight training schools and universities to recruit young pilots-to-be to join our team upon completing their training programs. We work

closely with them to acquire the best talent. Currently, there are no immediate plans to open our own Pilot Training Academy, but this could be an option in the future.

Aviation Turkey: What would you like to say about the labor force participation rate (female-male ratio), and the level of female employees in professional groups within Pegasus Airlines? What are your corporate activities towards the development of gender balance in aviation?

Güliz Öztürk: Striving towards gender balance of our employees is very important to us. We are proud to say that as of September 2019 we have 1,904 female staff (32% of our total workforce) across every department of the business, which includes 44 female pilots and 258 in our head office (42% of total HQ).

Moreover, in August 2016, Pegasus Airlines became the first airline in the world to join the Women's Empowerment Principles (WEPs) platform, illustrating the importance we place on the role of women in business and equality. With our participation in the platform, we have demonstrated our intention to incorporate and implement the Women's Empowerment Principles in every aspect from our management board to our supply chain.

As a member of the Gender Balance Development Commission of the General Directorate of Civil Aviation, we have also initiated efforts to raise awareness about aviation opportunities among women, and to increase the quantitative and qualitative role of women in aviation.

Within the scope of the Manifesto of Supporting Gender Equality created by PWN Istanbul, which was established to accelerate the achievement of gender balance in society and business life, Pegasus Airlines General Manager Mehmet T. Nane is participating as a PWN Equality Ambassador and has undertaken to volunteer to raise public awareness on the issue.

I'm currently holding the co-chair position of the Women in Sales (WiS) platform, which was established

in 2019 to ensure the balance between women and men in company sales departments.

Aviation Turkey: In relation to the previous question, is it possible that Pegasus Airlines, which has positioned itself as 'Turkey's Digital Airline', is able to consider itself as a 'Women Friendly Airline' company with its position in terms of the number and level of female employees and future gender balance efforts?

Güliz Öztürk: Absolutely. As our policies and corporate activities above demonstrate, we attach great importance to furthering the role of women in business and aviation. We will be continuing these activities and developing them in the coming years.


Aviation Turkey: Finally, would you like to convey any message to our readers?

Güliz Öztürk: Our airline is founded on the vision that everyone has the right to fly, and we work hard in every aspect of our business to democratize travel and provide our guests with the lowest fares, a seamless and easy travel experience and lots of choices with personalized services and a wide network – to make this vision a reality. As such we look forward to welcoming both our current and new guests to Pegasus Airlines to enjoy the freedom of low-cost travel 🌍



Havelsan's Innovation and Advancements Open up New Civil Aviation Market Opportunities

In this interview General Manager of Havelsan, Ahmet Hamdi Atalay discusses the Cornea JV with Turkish Technic, the developing market of Civil Aviation Simulators, Air Traffic Control and Airport Surveillance Radar simulation training and the company's willingness to support new training through different types of partnerships and investment models as they are in talks with several domestic and foreign investors.

 **Aviation Turkey:** Havelsan and Turkish Technic formed the company Cornea by signing a cooperation agreement on in-flight entertainment systems and the internet. What is the current situation of Havelsan's work on in-flight entertainment systems? What is the position and work share of Havelsan in Cornea regarding the technological infrastructure and R&D studies?

Ahmet Hamdi Atalay: Within the scope of the partnership initiated by the Strategic Cooperation Agreement signed between Havelsan and Turkish Technic in 2012, the first prototype of the Wireless IFE system was completed in 2014, and the development of the Seat-Back IFE prototype was added to the agreement. In 2015,

Havelsan obtained EASA approval for Wireless IFE and won THY's Wireless IFE and Tablet IFE tender in 2016. Currently, Havelsan is planning to compete with foreign companies in Seat-Back IFE tenders of Turkish Airlines' new and old aircraft and carry out Line Fit work for Boeing and Airbus platforms. In the first stage, the company won the Seat-Back IFE tender for the 45 aircraft to be added to Turkish Airlines' fleet in 2022.

Turkish Airlines became the first user of the wireless in-flight entertainment system developed by Turkish engineers and technicians in cooperation with Havelsan and Turkish Technic. Thanks to the system implemented in Turkish Airlines' 44 narrow-body passenger aircraft without the Seat-Back screens, passengers can connect to the in-flight entertainment system via their electronic devices (smartphone, tablet, notebook) and display the media content specially prepared for this system. With the wireless in-flight entertainment system, passengers can access more than 250 movies, 700 television programs, and more than 19,000 songs in over 2,000 albums. Passengers can also follow the current flight on the interactive map and access information about the flight.

It was decided upon to continue the work through Cornea Aviation Systems Industry and Trade Inc., a joint venture company of Havelsan and Turkish Technic. The title of the new company has been designated as "Cabin and Air Transport Information Technologies Industry and Trade Inc.," and it is planned to operate in In-Flight entertainment, internet, and civil aviation information technologies. The Company's customer potential is envisaged to include domestic airlines as well as foreign airlines.

As Havelsan, we have transferred all our products, systems, and projects developed in the field of In-Flight Entertainment Systems to company Cornea along with our IP rights. During the establishment stage, as Havelsan, we will continue to provide Cornea with Technical Support Services, including Software Consultancy and Production Services, for the establishment of software development processes and infrastructures as well as enabling access to Airbus and Boeing companies Seat-Back IFE Product Catalogs. Thus, Cornea will become a major supplier such as Panasonic Avionics and Thales.

As Havelsan, we have registered our production capability with the EASA, an independent

and qualified authority in Europe. As a result of this certification process carried out within the framework of the specific rules and requirements of civil aviation, the Seat Electronic Box (SEB) hardware and software produced within the scope of the In-Flight Entertainment Systems (IFE) projects can be used in civil aircraft. Thanks to our cooperation with Cornea on Hardware Design and Production for Civil Aviation, it will be possible to increase product diversity and quantity in the future. We have the opportunity to extend our production capacity for different products and product components through productization studies. However, companies such as Agusta Westland and Sikorsky, and platforms such as the A400M, also request this document for military platform production. Havelsan is the 7th company that received the Production Organization authority in our country (Aspilsan, Selex, TCI-Turkish Cabin Interior, TSI-Aviation Seats, Turkish Technic, and Turkish Aerospace).

 **Aviation Turkey:** Havelsan developed the Boeing 737-800NG Full Flight Simulator and delivered it to Turkish Airlines (EASA) with a CS-FSTD-A FFS Level D certificate. In this regard, can you inform us about

INTERVIEW



the projects carried out with Turkish Airlines and other airlines?

Ahmet Hamdi Atalay: Our B737-800 NG simulator, which was delivered to Turkish Airlines at the end of 2017, was obtained the EASA Level D certificate at the beginning of 2018 and started to be used in pilot training. Thus, our first business relationship with Turkish Airlines within the scope of civilian simulators developed in late 2018, is further strengthened with a contract to procure an additional 11 simulators.

The simulators we will produce for THY are currently in the development and production phase, and we will deliver the first system at the beginning of 2020. Subsequently, the delivery of other simulators is planned for the middle of 2021. In light of our experiences, we have new relationships in which we

offer our proposals in line with the demands of both domestic and international airline companies and training organizations. As Havelsan, we will definitely take part in the developing market of Civil Aviation Simulators.

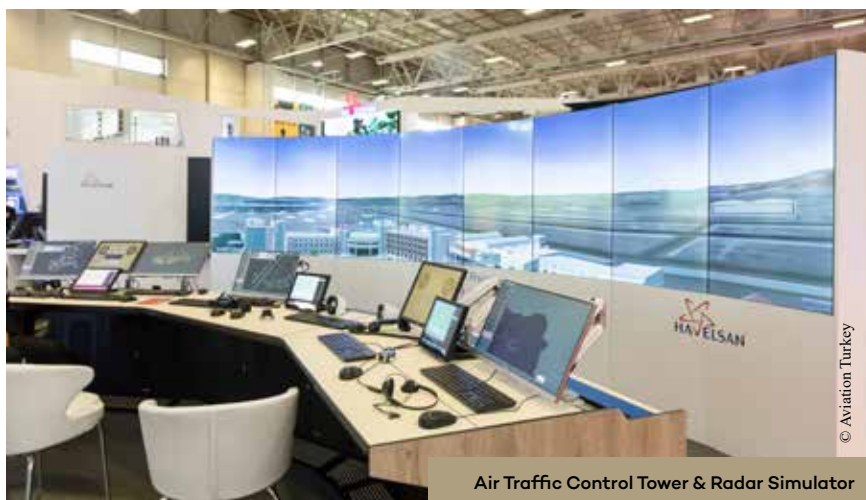
Aviation Turkey: You are working with the General Directorate of State Airports Authority (DHMI) and TÜBİTAK on Air Traffic Control and Airport Surveillance Radar

Simulators. Can you give us information about your capabilities and R&D studies in this field?

Ahmet Hamdi Atalay: Air Traffic Control and Airport Surveillance Radar Simulator is a simulation system that can meet basic and advanced training needs. It supports all levels of Air Traffic and Airport control. Basic training, Advanced training, Procedure training, Traffic scenarios, etc., can be

divided into phases. Our simulator is designed to be extended up to 360° in software and hardware with a 3-dimensional visual system where day, night, weather, and seasonal effects can be observed.

Together with TÜBİTAK, the deliveries of the atcTRsim simulator to Esenboğa Aviation Academy and Istanbul Atatürk Airport Training Center have been successfully completed, and the system became operational. Our simulator is used effectively both in the training process of controller candidates and in airspace optimization studies. For example, during the design process of the Istanbul Airport airspace, the real environment was simulated with virtual traffic through our simulator, and the problems that might occur in the airspace at the opening of the Istanbul Airport were foreseen and corrected.



Air Traffic Control Tower & Radar Simulator



In addition to airports, in October 2018, a separate simulator was also offered to Nişantaşı University students.

Traffic scenarios and exercises can be prepared flexibly on the simulator, voice communication can be established between the pilot-controller and the controller-controller, and the air and ground vehicles can be controlled with the help of the pilot application.

In Air Traffic Control and Airport Surveillance Radar simulation training, each station can work individually or in groups of any number of positions when necessary to provide individual or sectoral work opportunities. Therefore, the Air Traffic Control and Airport Surveillance Radar studies can be carried out independently of each other and with the integration between the two systems, an

exercise run from the radar simulator or the airport control simulator can be displayed in another system in accordance with the date, flight route, flight phase, flight plan information to provide service integrity by running the tower, approach and road control stations at the same time.

Aviation Turkey: What are your goals and activities in the field of civil aviation for global markets? What can you say about Havelsan's vision for the future?

Ahmet Hamdi Atalay: As Havelsan, we have

presented the solutions that we have gained in the military sector with our local and national capabilities to our country with our Boeing 737NG Full Flight Simulator, which we delivered to Turkish Airlines about two years ago. As a continuation of this, we also continue to manufacture 11 simulators for Turkish Airlines' A320 and Boeing 737 MAX platforms, 5 of which are Full Flight Simulators. With the strong reference of Turkish Airlines, a leading brand in civil aviation, we have focused on business development and marketing activities

abroad, as well. In this field, where we compete under heavier competition conditions compared to the military sector, we aim to provide an advantage over our competitors with our quality, different payment terms spread over longer periods, and after-sales support. In this context, we plan to continue not only with direct sales but also with different types of cooperation and partnership models.

Aviation Turkey: Will Havelsan carry out any activity in the establishment and operation of a national training center in areas such as pilot training, ATC, and Maintenance technician training in civil aviation?

Ahmet Hamdi Atalay: Civil aviation is developing at a very high speed due to the increasing demand for air travel not only in our country but also worldwide. With the new destinations established in parallel with the increased number of airports, various new aircraft of different types are joining airline fleets. Consequently, the increase in sectoral employment also causes an increase in training requirements for qualified personnel. Contrary to this rate, there is no increase in the number and capacity of centers providing training to related staff members. In Turkey, this demand cannot be met



Turkish Airlines - Boeing 737-800NG Simulator

INTERVIEW

sufficiently. Although there are numerous simulators and training systems in the training fleet, many airlines operating in our country, including Turkish Airlines, meet this demand from established training centers abroad. I can state that the need to add new ones to the few specialized education centers in our country as soon as possible has emerged as a need. As Havelsan, we do not have a plan to assume this responsibility on our own, but we want to support new training centers that will open with different types of partnerships and investment models. In this regard, we are in talks with several domestic and foreign investors.

Aviation Turkey: Do you have a plan to establish and operate an Integrated Simulation Center of Excellence (Aircraft, Unmanned Aerial Vehicles, and ATC) that will address and manage the threats posed by the unmanned aerial vehicles, which have become one of the most significant problems of aviation security?

Ahmet Hamdi Atalay: It is possible to simulate UAV or drone threats and many other scenarios in a realistic way in numerous simulator systems we have delivered to date. Havelsan develops and provides simulators of all types of air, land, and sea platforms in the inventory of our security forces in line with

the demands and needs of the Turkish Armed Forces. We also develop and deliver simulators of weapons and defense systems in the TAF inventory. We have the infrastructure for all our simulators to work together in a joint operational environment. For example, with our F-16 simulators, large-scale drill and operational preparations can be carried out in a networked manner. In this context, we also have integrated simulations with the ability to provide networking between various military bases. We have developed our indigenous Tactical Environment Simulation product with the experience gained from all our previous simulator projects. As you have mentioned, with this product, we have developed a simulation capability that includes simulations of aircraft, helicopters, various UAVs, air traffic control towers,

air defense systems, drone threats, and human behavior. Additionally, we deliver this simulation capability by further developing each product within each simulator center we provide. It is also possible to construct them as a separate simulation center. Havelsan has the capability to establish all kinds of simulation centers, from system training to tactical purposes.

Aviation Turkey: Can you inform us about your approach to develop and produce basic simulation products that can be used before and at the beginning of flight training to encourage and promote flight training?

Ahmet Hamdi Atalay: In this regard, we continue our efforts to develop more practical and cost-effective solutions by using our experience in modeling and simulation with the R&D and P&D projects that we have developed

with our own resources, as well as taking advantage of significant technologies such as games, artificial intelligence, AR, VR, and MR which have become a trend today.

Aviation Turkey: Do you have any strategy for Havelsan to split especially its military and civil aviation activities into two organizations, as in the case of Airbus Military and Airbus?

Ahmet Hamdi Atalay: In the current situation, I believe that there is no need to make such a change in our organization. However, I would like to emphasize that as Havelsan, we have the flexibility to make the necessary changes in our organization and our processes when needed, in case of further development of the market and increasing demands from abroad.

Aviation Turkey: Mr. Atalay, thank you very much for giving us your time... 🙏



Cem Akalın, Ahmet Hamdi Atalay and Ayşe Akalın

THE DESTINATION FOR THE AIRCRAFT INTERIORS INDUSTRY.

Aircraft Interiors Expo 2020

31 March - 2 April 2020, Hamburg Messe, Germany

Aircraft Interiors Expo is the world's leading event where airlines and the supply chain can source the latest innovations, technologies and products for cabin interiors, inflight entertainment, connectivity and passenger comfort.

See how you can join us at
www.aircraftinteriorsexpo.com

SAVE THE DATE

31 MARCH 2 APRIL 2020



**600 INNOVATIVE
EXHIBITORS**

**16,000 INDUSTRY
ATTENDEES**

**245 AIRLINES
REPRESENTED**

Co-located with:

World Travel Catering
& Onboard Services
EXPO 31 Mar - 2 Apr 2020
Hamburg Messe, Germany

Passenger
Experience
CONFERENCE

Organised by:

Reed Exhibitions[®]

In co-operation with:

Hamburg
Messe

Supported by:

apex
airline passenger experience association

Ready for Take-off: Aviation English From Past to Future

by Gökhan Demirdöken, Researcher & English Language Instructor

Turkey has been the shining star of civil aviation over the last decade with its rapidly growing air traffic network, increasing interest in civil aviation, and never-ending demand on high-qualified aviation personnel. These developments both vow a bright future for Turkish civil aviation and necessitate the implementation of some new regulations including the ICAO requirements regarding the proficiency in Aviation English.

How is the increase in air traffic related to Aviation English?

Travelling by plane is fast becoming a part of many people's daily routine. While some people simply use airplanes to travel on holidays or to pay a visit to someone, others frequently make use of them for business purposes. It is a well-known story for frequent flyers who commute to work by plane daily. More interestingly, these people pay for unlimited access to travel with the airline companies offering early flights to business centers. No matter how early they



get up in the morning or how punctual they should be to catch their daily flight to work, the number of these people will keep increasing each year. What's more in the near future, airplanes will be an indispensable means of transportation in our lives for our nine-to-five jobs. That's why civil aviation has played and will always play a crucial role all around the world. The figures also say so. It was reported by International Air Transport Association (IATA) that 4.4 billion passengers preferred air travel in 2018 with an increase of 6.9% over 2017 in the world. Similarly, the latest report

by General Directorate of State Airports Authority on air travel statistics in Turkey reveals the fact that over 1 million people preferred travelling by plane in Turkey between September 1-30, 2019. Upon completion of all phases, Istanbul Airport will reach the capacity to serve 200 million passengers annually. This will place the new airport and Turkey as one of the greatest hubs in the world. However, such growth in civil aviation both in Turkey and in the world signal a crucial issue for aviation authorities: safety.

Safety is, by far, the most important component of aviation both in the air

and on the ground. From the very first moment passengers' step inside the terminal building until they leave the airport at their final destinations, numerous safety checks are performed to ensure a safe flight. Nevertheless, human factor dominates all of those safety checks and for this reason, reducing the risk of air traffic accidents depends very much on annihilating the human factor. Although it is still unclear whether pilots, air traffic controllers, ground handling staff, line maintenance staff can be replaced or not by robots in the future, we know something for sure

that we still need to rely on human-human interaction which means that any message will still be sent and received by human beings in the upcoming decades. Until that time, we have to keep learning more about human factor in civil aviation by analyzing the milestones to shape our future. The most prominent example of milestones in the history of civil aviation was what started in 1871 with an attempt to leave off the grass and stay in the air for a couple seconds. It was a ground-breaking success in civil aviation history at that time. Over the past 148 years there have been more of it such as the latest 19-hour record-breaking flight of Qantas. Although, it set a record for the world's longest non-stop commercial passenger flight, it might have set another record. The first attempt of Wright brothers did not necessitate any type of ground handling or air traffic communication. However, current position of civil aviation now demands more aviation professionals than any time before. These include pilots, cabin crew, air traffic controllers, line maintenance staff, ground handling staff and so on. Meeting the demands of civil aviation is an important concern of aviation authorities and companies yet the real concern should be

employing those who can comply with the requirements of aviation sector to minimize safety concerns regarding human factor.

The role of Aviation English becomes more and more clear when it comes to safety concerns. The increase in flight networks has made English language the top priority for airline companies and civil aviation authorities. Although professionals in the field of aviation have started to take the role of English language into consideration more seriously over the last decade, the emergence of Aviation English dates back to as early as World War II. Until it finally came to an end, communication was not considered as a major safety concern in aviation as the sky was relatively empty when compared to 2019. Later on, member states of North Atlantic Treaty Organization (NATO) held the Convention on International Civil Aviation in 1944. The convention addressed the issue of air navigation in global civil aviation. Just after three years, in 1947, the International Civil Aviation Organization (ICAO) was formed. It only took four years for ICAO to declare English as the official language of aviation and ICAO made the use of English for communication purposes

for international flights obligatory in all airspaces. From 1951 when English was officially mandated for communication until today, aviation history has witnessed several accidents. As always, the causes of these air traffic accidents have been crucial in understanding and putting forward advisory resolution to civil aviation communities. The research puts forwards that, from 1996 to 2005, out of 183 accidents the precise reason of which is known, 74 are related to pilot error. In an attempt to analyze the causes of such accidents and incidents, NASA researchers concluded that communication breakdown among pilots is more likely to reflect failures when compared to deficiencies in technical proficiency. This sheds light on the crucial role of communication in civil aviation. More interestingly, the data regarding the reports on NASA's Aviation Safety Reporting System allowing pilots to report incidents revealed the fact that communication problems make up over 70% of what was reported on the system.

Unfortunately, the undeniable fact that communication is at the heart of civil aviation is not only limited to such reports. In 1976, the mid-air collision of

a trident and a DC-9 caused the death of 176 people. This collision over Zagreb, Croatia was one of the earliest examples of inadequate English language proficiency. British Airways flight 476 from London Heathrow Airport to Istanbul Atatürk Airport with 54 passengers and 9 crew members on board collided with Aviopromet flight 550 from Split to Cologne-Bonn at an altitude of around 10,000 meters. The eyewitnesses of this tragic accident saw corpses, bags, and other stuff falling from the sky. After the investigation, official reports pointed to English ability as contributory factor of the so-called Zagreb accident.

It had not been a year when the whole world was shocked by the Tenerife disaster. It was March 27, 1977 at Los Rodeos Airport, two Boeing 747 airplanes collided on the foggy runway 30. The Dutch carrier KLM was operating from Amsterdam to Las Palmas and similarly Pan-American was serving on the route from Los Angeles to Las Palmas. However, the explosion in Las Palmas airport, they had to divert to their fate. The series of events ending up with the disaster in Tenerife had started with the taxi of KLM's 747 to the end of runway. The pilots were cleared for taxi to the end

of runway 30 and asked to hold position before take-off. Meanwhile, Pan-Am pilots were cleared to taxi on the same runway and asked to leave runway via C3. Then, having not clearly acknowledged the message KLM pilots started their take-off roll while Pan-Am was still taxiing on that runway. When Pan-Am tried to get off the runway, it was already too late? Although KLM had not been cleared for take-off, pilots had reported that they started their take-off roll over radio stating "at take-off" to a non-native English speaker Air Traffic Controller who took the "at" to literally mean "at the take-off position". The worst accident until that time in civil aviation caused the death of 583 people. The official reports regarding the causes of the Tenerife Disaster indicated that English language proficiency was again a contributory factor.

These were followed by the accident of Avianca Boeing 707 after a fuel exhaustion in John F. Kennedy Airport in 1990 with 73 deaths, the accident of American Airlines Boeing 757 in Cali, Colombia in 1995 with 159 deaths, and the mid-air collision of an Illusion 76 and a Boeing 747 over Charkhi Dadri in India in 1996 with 349 deaths. The common issue regarding

all of these accidents was the use of and proficiency in English language as a contributing factor.

The consequences of these accidents were fatal, and this led to a number of regulations to be implemented on English language proficiency of aviation personnel over the years. In 1997, the Federal Aviation Administration in the USA advised ICAO the legislation on English proficiency for pilots and air traffic controllers. Then, in 1998, ICAO published a resolution A32-16 stating the Council was urged to direct the Air Navigation Commission to consider the matter of English Language Proficiency ... and to strengthen the relevant provisions of Annex-1 & 10- obligating Contracting States to take steps to ensure that air traffic controllers and flight crews involved in flight operations in airspace, where the use of the English language is required, are proficient in conducting and comprehending radiotelephony communications in the English language. Furthermore, ICAO established a study group called PRICE to review the language proficiency issue and develop a future plan regarding it.

Until 2004 when the ICAO Manual on the implementation of language proficiency

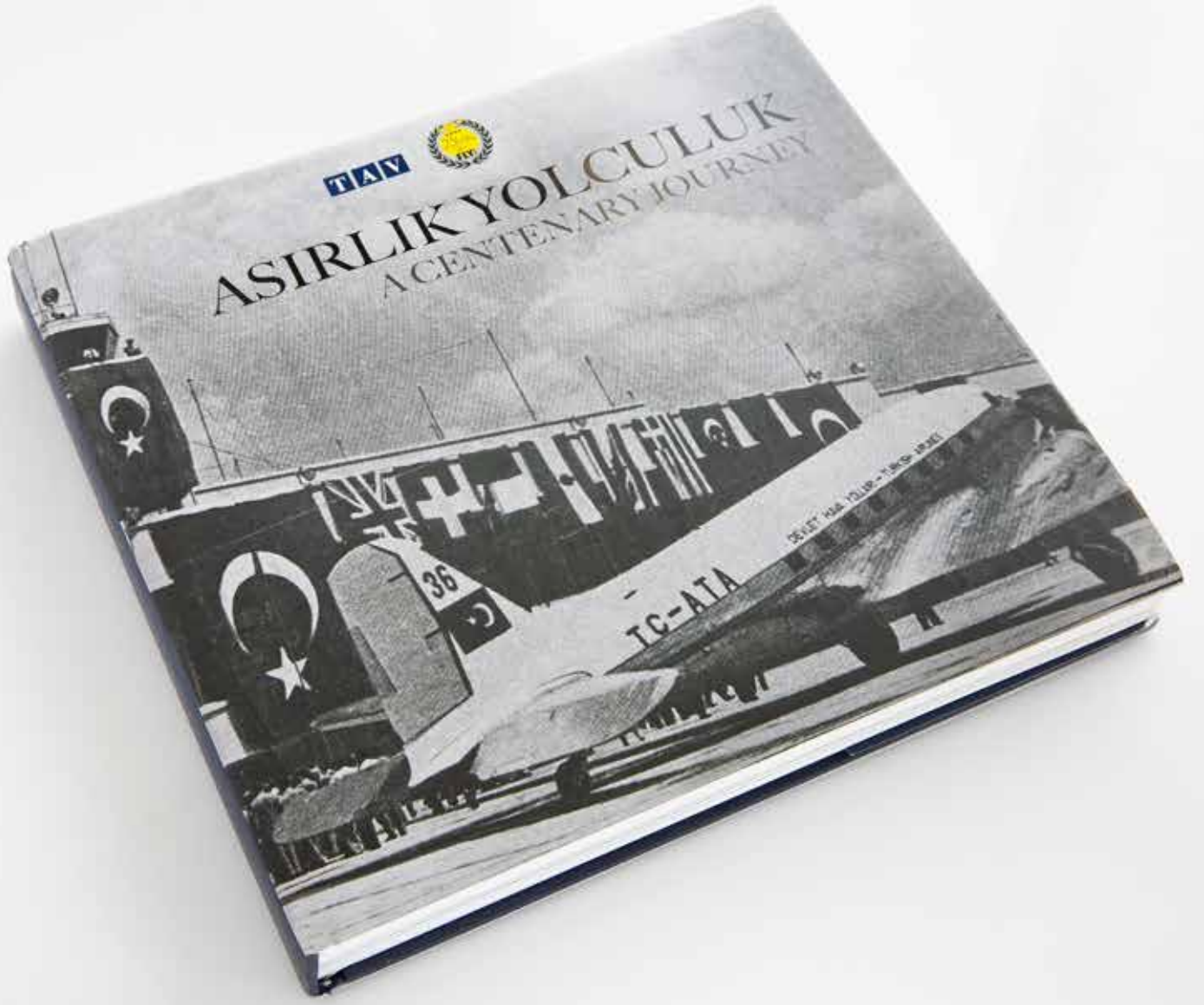
requirements was released, two more air traffic accidents happened. The first one was in 2000 and included an MD 83 and a Shorts SD330 which collided on the runway at Paris Charles de Gaulle Airport. It was formally determined that the language used for communication was a contributory factor as the SD330 crew were not aware that the MD 83 was going to take off. Similarly, in 2001, A Scandinavian MD 80 airliner with 104 passengers on board hit a private aircraft Cessna Citation killing 118 people. Everything seemed to be under control until the very last moment when the Cessna crossed the runway holding sign and entered the active runway 18L/36R while the MD-87 was speeding down the runway for take-off. The official reports showed that radio communications were performed in Italian and English language and the communication between the pilots of Cessna and ATC was far from acknowledging the real position of Cessna which then led to the collision.

Since 2004 when ICAO implemented new regulations on language proficiency requirements for air traffic controllers and pilots with an aim to improve the level of English language proficiency and reduce the number

of communication breakdowns in civil aviation, the year of 2011 was set for the completion of these set of standards' full implementation worldwide. The ICAO Language Proficiency Rating Scale included pronunciation, fluency, structure, vocabulary, comprehension, and interaction with a scoring of 1 to 6.

Today it is possible to observe the effects of this regulation by ICAO in different areas such as operators and language schools offering Aviation English courses, and both national and international institutions assessing the English language proficiency of air traffic controllers and pilots. While more and more Aviation English courses are offered each year by a growing number of institutions and language schools, the scholars also take teaching of Aviation English as part English for Specific Purposes (ESP) very seriously for improving the quality of such courses. Ultimately, everything that led to the implementation of new regulations on English language proficiency clearly paves the way for the increasing importance of Aviation English in the world and it is now "Ready for Take-off".

Stay tuned for more about Aviation English during its cruise 🌐



Fotoğraflarla, İstanbul'da ve özellikle Yeşilköy'de başlayan Türkiye'nin yaklaşık 100 yıl öncesine dayanan havacılık serüveni...

With photographs, Turkey's 100 years of Aviation Adventure that started in İstanbul and especially Yeşilköy.

Bir Gökhan Sarıgöl projesi olan Asırlık Yolculuk, TAV ve Fly Service ortak yapımı olarak Atatürk havalimanı tarihine ışık tutuyor...

A Gökhan Sarıgöl project, a Centenary Journey, sheds light on the history of Atatürk Airport as a joint production of TAV and Fly Service.





Singapore Airlines

The World's Longest, Non-Stop Commercial Flight Operator


Singapore Airlines General Manager Mark Seah: "We would like to further consolidate and strengthen our position in Istanbul in the near term."



 Aviation Turkey: Mr. Mark Seah, first of all thank you for your time. Singapore Airlines has been organizing nonstop flights to Turkey for nearly 30 years and is known as the first airline flying from Asia to Turkey. Can you tell us about the history of the operations in Turkey and future plans of the company?

Mark Seah (MS): Singapore Airlines started to fly between Istanbul and Singapore on 29 Oct 1987 which was Turkish Republic

Day and memorable. In 31 years' time we have flown between Singapore – Istanbul via Manchester, Dahrn, Dubai and Athens by B747, B773 and B772. Since 2010 we started to fly non-stop between 2 countries. Within this year we are expecting a new A350 which will serve the market with Business Class, Premium Economy Class and Economy Class.

 Aviation Turkey: Singapore Airlines organizes 5 direct flights from Singapore to Istanbul

airport and we know that you are willing to increase the number of flights to 7. In the near future do you see any new flights coming to other airports in Turkey?

MS: SIA has many strategic initiatives that have helped us to build a portfolio of airline products catering to multiple market segments across a range of brands. We have a diversified route network which is integral to ensuring that Singapore remains a hub, which requires a mix of

short-haul, medium-haul, long-haul and ultra-long-haul operations. There are currently no plans to start services to other cities in Turkey, although we constantly review our network and are open to exploring opportunities should the conditions be favorable. Istanbul is still Turkey's largest city in terms of population size and economy, and we would like to further consolidate and strengthen our position in Istanbul in the near term.



© Singapore Airlines

✈️ Aviation Turkey: You have been placed on the top rankings on the Skytrax awards, the world's top airlines, for many years. In 2018, you were selected as the best airline company in the world by Skytrax aviation awards. Behind this success there has to be a well-planned strategy, a competent and qualified structure. Could you please share with us a bit more about the factors that created this success?

MS: The key elements of safety, a zealous focus on our customers, product innovation and leadership, as well as network connectivity, form the foundation of our competitive offering. What has been essential to Singapore Airlines' growth and success over the years is a commitment to placing the customer first in our efforts to deliver unsurpassed service levels, as well as

a culture of product and service innovation. We constantly strive to make our customers feel at home, both on the ground and in the air.

✈️ Aviation Turkey: Singapore Airlines operates the world's longest, non-stop 18 hour commercial flights between Singapore and New York, and Istanbul - Singapore direct flights take 12 hours. What does Singapore Airlines offer their passengers in terms of safety and comfort during 10 hour flights? What characteristics and features separate you from your rivals?

MS: We do not comment on our competitors, but SIA and Canyon Ranch, the world's premiere integrative wellness brand, have forged a partnership to re-invent ultra-long-haul travel with a focus on wellness cuisines, rest and relaxation, and general well-being on the world's longest flights.

The Canyon Ranch team of experts from integrative medicine, exercise, nutrition and other disciplines have developed science-based strategies for improved sleep, exercise and stretching, as well as new, nutrition-focused menus, applied specifically to SIA's non-stop service between Singapore and New York (Newark). The program will also extend to Singapore-US non-stop services to Los Angeles and San Francisco.

•*Wellness Cuisines - developed by Canyon Ranch chefs and nutritionists focused on nutrition and hydration (taking into consideration longer flight duration with less body movement), combined with bold flavors and textures. These wellness cuisines are offered in addition to SIA's own meal selections and creations by its International Culinary Panel chefs.*

•*Rest and Relaxation - which includes sleep strategies designed to help customers in all cabin classes improve the duration and quality of rest, as well as specific*



© Singapore Airlines

Mark Seah



light settings in providing better cabin ambience for rest and relaxation.

•Guided Stretching Exercises - led by Canyon Ranch exercise physiologists, accessible via personal seatback entertainment systems to promote relaxation.

✈️ Aviation Turkey: Air Cargo is another challenge that has been a thriving sector in Turkey for a while and Singapore Airlines plays an active role in the air Cargo of the Western Pacific region. Could you please inform us about the destinations and carrying capacities that are available from Turkey?

MS: SIA Cargo has operations to 144 destinations over 5 continents, and most of the capacity comes from the belly hold of our passenger aircraft across the SIA Group. In particular to the South West Pacific, we have cargo operations to 9 cities in Australia and 3 cities in New Zealand.

Other than passenger aircraft, we also operate the B744 freighter aircraft to Sydney, Melbourne and Auckland. From Turkey itself, we have cargo capacity in our belly hold of up to 16 tons per flight.

SIA Cargo is able to provide our customers with a wide range of services like handling perishables, live animals and e-commerce amongst others. We recently launched the THRU COOL service in September 2018, which is a cold chain service to transport high-value, time-sensitive and temperature-controlled pharmaceutical cargo with speed and reliability. We were the first airline in the Asia Pacific region to receive the IATA CEIV Pharma certification in 2017 and we were subsequently named the Best Air Cargo Carrier for Asia at the 2018 Asian Freight, Logistics & Supply Chain (AFLAS) Awards.

✈️ Aviation Turkey: Scoot airlines, the subsidiary brand of Singapore airlines, is a low-cost airline company and highly preferred in the Asia region. We also know that Scoot is eager to widen its network with more long-haul flights such as Europe etc. What are your projections for Scoot long haul flights?

MS: Scoot launched non-stop flights from Singapore to Athens and to Berlin in 2017 and 2018, respectively. Results have been promising so far, and therefore Scoot is cautiously optimistic that there is indeed a growing market for budget long-haul travel. That said, launching long-haul routes requires substantial investment and complex operating considerations, so Scoot is currently focused on building the existing routes in terms of load factors and yields, while also growing its

brand presence in these new markets. If there are other budget long-haul destinations with promising demand, we will be sure to explore.

✈️ Aviation Turkey: We see that low-cost airlines do not have much long-haul flight experience in the world. In conjunction with these long-haul flights, Scoot aims to gain different experience in the sector. Could you please tell us about your forecast of the low-cost long-haul flights' growth in near future? If we consider the customer experience, comfort and satisfaction, how do you define your new approach in these flights?

MS: As mentioned earlier, we see potential in the budget long-haul model in Asia, especially with the emergence of more middle-class consumers seeking to travel. Scoot was one of the first low-cost carriers to operate the

INTERVIEW



© Singapore Airlines

widebody 787 Dreamliners, which made previously uneconomical routes viable and significantly reduced unit costs. The Dreamliners are more spacious than narrow body aircraft and have better air quality and quieter engines. They also allowed Scoot to develop contemporary add-on products for the long-haul traveler in mind,


such as inflight Wi-Fi, in-seat power, our child-free ScootinSilence cabin and our ScootBiz product for those seeking a more premium experience. These features led us to be one of the first to elevate the low-cost carrier experience and make the prospect of low-cost long-haul travel attractive to customers.

To find out more about

Scoot's products and services, please visit our website at www.flyscoot.com

 **Aviation Turkey:** Singapore Airlines places a special emphasis on technology and technological developments. Can you tell us about the first blockchain based digital Wallet KrisPay?

MS: KrisPay is the world's first blockchain-based airline loyalty digital wallet and was launched in July 2018. The technology was developed in collaboration with KPMG Digital Village and Microsoft and comes in the form of an app which can be downloaded from Apple and Google Play Store. KrisPay allows our frequent flyer members to convert their KrisFlyer miles into KrisPay miles instantly through the app for everyday spending at partner merchants in Singapore, ranging from food & beverage to petrol to retail. We are actively looking to partner with merchants around the world to offer our global KrisFlyer members more avenues to spend their KrisFlyer miles.

 **Aviation Turkey:** Finally, do you have a message for Aviation Turkey readers?

MS: Thanks to the support of your readers and local partners, SIA has served the Turkish market for more than three decades, and we look forward to many more years of success and growth. It has been our joy to bring many people from around the world to witness and experience the beauty of Turkey, and at the same time become a bridge between Turkey and the rest of world, facilitating an exchange of ideas, trade and culture. We look forward to welcoming you onboard our flights soon 🌟



© Singapore Airlines

STM Civil Aviation Solutions

The power of defence industry
in the service of civil aviation



Electronic Flight
Bag (EFB) / AeroTab™



Paperless Integration of
Cockpit, Cabin and OCC /
AeroSuite™



Integrated Flight
Surveillance System /
OpsEye™



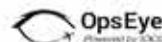
Meteorological Analysis
Dashboard / OpsME1™



EASA DOA
(Design Organization
Approval)




Cyber Security
Solutions





STM Taps into the Enormous Opportunity in Civil Aviation

In this interview Ömer Korkut – STM Chief Technology Officer discusses how STM has evolved to meet the needs of Civil Aviation along with the defense industry. By partnering airline companies and the General Directorate of Civil Aviation, digital services for the direct digitization and automation of civil aviation, including indigenous cybersecurity solutions will ensure the security of these services.

 Aviation Turkey: Mr. Ömer Korkut, first of all, thank you for taking the time for this interview. In general, STM is one of the leading companies that carry out projects in the defense sector; however, you also have a growing and developing structure in the


field of civil aviation. Could you briefly inform us about your activities and projects in the field of civil aviation?

Ömer Korkut: As a defense industry company, we have been conducting various projects and providing engineering

and consultancy services since 1991 when we were established under the leadership of the SSB. STM's adventure in product and service development related to military aviation begins, especially in the early 2000s. Afterward, we entered both the public and

private sectors by shifting our capabilities that were developed on the military side to the Civil Aviation side, which has enormous potential. At similar times, products and services related to the development of Turkish Civil Aviation had already begun to emerge.

As you know, STM is committed to developing innovative technologies. Therefore, STM tries to identify the areas where there is a gap and instead of offering similar solutions, develop products and services with the needs directly coming from Civil Aviation and provide these to the sector. In the field of Civil Aviation, we work with both Turkish Airlines and Atlasglobal, but this is not limited to developing a technological product and service in the classical sense, but also includes the security aspects of civil aviation such as safety and security. With its investments in cybersecurity for the last five years, STM has evolved to meet the needs of Civil Aviation along with our defense industry. Therefore, together with our airline companies and the General Directorate of Civil Aviation, we develop digital services for the direct digitization and automation of civil aviation, including unique cybersecurity solutions that will ensure the security of these services.


 **Aviation Turkey:** According to the data from the last two years, 90-95% of STM's total annual turnover consists of defense sales. Do you have a new restructuring plan in your future projection that will increase your investments in the field of civil aviation and get more shares from turnover in

this area? Can you inform us about your short and medium-term goals?

Ömer Korkut: Since STM is primarily a defense industry company, it gains a significant portion of its turnover from defense products. This should be seen natural, and as you already know, defense is a substantial value-added sector both in our country and in the world. Because, while the other sectors are more commercial, the commercial side of the Defense Sector can sometimes come as secondary. Thus, from a business point of view, our priority is to meet the needs of the Defense Sector, and we are continuing our work in this direction. What is essential in Civil Aviation, on the other hand, is that you must introduce your products and services to the right market at the right time. The scope of Civil Aviation in Turkey is determined, and we are working with some of the great players here with certain principles. With our experience in this sector, we develop our products and services not only for the domestic market but for foreign markets as well. We believe that the real added value, namely the increase in turnover, will be possible by marketing and positioning these products abroad. We will continue to expand our human resources in Civil Aviation in the case of need, but our main structure in the

coming period will be about introducing our civil aviation products to foreign markets rather than developing talent.

Moreover, our initiatives to take part in common platforms, including the TOBB Civil Aviation Assembly are continuing, in order to learn about the needs of the civil aviation sector and to meet these with our technologies.


 **Aviation Turkey:** As a company that increases its awareness and effectiveness in the field of Civil Aviation, you signed a multifaceted cooperation protocol with the General Directorate of Civil Aviation (DGCA) in January last year covering many areas of civil aviation. In particular, this protocol draws attention to "cybersecurity cooperation", "aviation security cooperation", and "airworthiness". In short, what would you like to tell us about the scope of the protocol of this cooperation, the activities carried out to date, and your capabilities in these areas?

Ömer Korkut: Of course, as you said before, when we talk about Civil Aviation, the security of civil aviation has become a big issue besides the products and services developed for the activation of aviation services. This year, for example, British Airways was fined. Why? Because of a data leak, personal

information of millions of its passengers leaked to the internet. When such events occur, airlines suffer both financial and moral damage. In this example, both British Airways' reputation was damaged, and the Company was fined by Information Commissioner's Office in the UK. In Turkey, there are several aspects of cybersecurity issues in civil aviation. Similarly, the Personal Data Protection Board conducts audits within the scope of the Law on the Protection of Personal Data (KVKK) in our country and imposes fines when it detects negligence/violations. Besides the data leak issue, there may be problems with the safety and security of Civil Aviation on the other side, not only with airlines but also with airports. Therefore, a significant part of our cooperation with the General Directorate of Civil Aviation (DGCA) also covers these fields. We planned various trainings on this subject and provided these trainings. We conducted some exercises with the DGCA. Our cybersecurity teams, which we call the "Red Team," conducted penetration tests with and without notice in certain places. We share the results of these tests with them within the scope of the agreement we have made with the DGCA. We consider that these results will be an

INTERVIEW

essential reference for the DGCA to decide on specific regulations, especially regarding Civil Aviation Security. Another capability of STM is the certification services it has provided since its establishment in the scope of consultancy, which is given to it as a mission. We are indeed a qualified company with the approval of the European Union Aviation Safety Agency (EASA) DOA (Design Organization Approval), so some of the activities with the DGCA are related to certification, and these activities also include training activities. We also continue to work with the DGCA to introduce our existing products to the aviation industry. We are working effectively and harmoniously, and I hope that we will get the results not only on behalf of STM but also for the whole Turkish Civil Aviation Sector.

 **Aviation Turkey:** Returning to the projects you carry out in the field of civil aviation, you have developed and deployed indigenous systems such as Electronic Flight Bag Capabilities (AeroTab™) and Paperless Cockpit-Cabin-Operation Center Integration (AeroSuite™) solutions as well as OpsMet™ web-based meteorological analysis application and OpsEye™ real-time Apron Area Air & Ground Surveillance Systems. What can you say about the advantages

and the capabilities of these systems bring to the operators and users in terms of cost, logistics, and ease of use? Can you inform us about the current domestic and international users, as well as the potential customers of these systems?

Ömer Korkut: Whether you are in the defense sector or the civil sector, you need to receive feedback from the field and establish an active user-developer relationship to develop accurate and effective products, or the emerging products cannot meet expectations. In the first place, we created this environment with our institutions and organizations so that we can work toward meeting their needs with our technologies. In this regard, the AeroTab™ Electronic Flight Bag, which is our first introduction to civil aviation and developed with R&D support, started to be used by Atlasglobal in 2014 after obtaining Airworthiness Certification. Atlasglobal provided significant input and support in the development of this product. In fact, in both the civil sector and the military sector, it is absolutely necessary to have user support and user feedback to develop such products so that they can be used effectively in the field. If this happens, the resulting products can be used very effectively and efficiently. We are talking about an



exemplary project in which the user and industry come together to provide an effective solution, and this collaboration has become a successful product. It is currently operated by Atlasglobal, as well as Atlasjet Ukraine, in a number of aircraft. We also signed a contract with Iraqi Airways. We hope to ensure its operational use in Iraqi Airways in the near future. Therefore, this product, which we call Electronic Flight Bag, is used not only in our country but also abroad. Of course, we intend to increase the number of airlines and the aircraft that use this product in the future.

So, how did this product help the user? 5-6 years ago, pilots used to come to the cockpit with a separate bag filled with all the flight plans and maps, and that bag would be quite heavy product depending on the flight status. Because the bag was filled with papers, the cockpits were called paper cockpits back then. We reduced it into a tablet, and it is also integrated

with the aircraft's systems, so it is not a "remote" tablet. Therefore, we are talking about a tablet that can receive real-time information from the plane. This has two benefits; first, it increases flight efficiency by ensuring that pilots have rapid access to the right information at the right time, and second it achieves significant fuel savings by eliminating the weight of printed documents. When we put all of these together, we can say that AeroTab™ Electronic Flight Bag is an essential value-added service for Civil Aviation industry.

Our other solution, OpsEye™, is actually a software product and is currently being used in the Turkish Airlines Integrated Flight Operations Control Center. The development story of this product started in 2015. All commercial aircrafts transmit an ADS-B (Automatic Dependent Surveillance-Broadcast) signal. The ADS-B signal is not encrypted, and it is


transmitted automatically from the moment the doors are closed before take-off and until the doors are opened after landing. In fact, the first starting point of this project was to optimize the taxi times at Istanbul Atatürk Airport in 2015. However, as we receive signals not only from the runway but also from the aircrafts in the air with the antennas we put into the airport, our product has become a kind of flight tracking application. The target platforms were not only the airplanes but also the push vehicles at the airports, which we call "push-back" vehicles. Therefore, both ground traffic and all air traffic within the airport-centered airspace with a radius of approximately 200 kilometers could be effectively monitored. After implementing the OpsEye project at Istanbul Atatürk Airport, we have been able to track all the airplanes flying over Istanbul, including the ones from Turkish Airlines, as all aircrafts transmit this signal. This was a highly rapid positioning for us. It was a service that we provided by bringing together Commercial-Off-The-Shelf (COTS) products and developing our own receiver applications. As you may remember, there was heavy snowfall in Istanbul in January 2017, and the system proved itself under those harsh conditions. Thanks to

OpsEye™, Turkish Airlines managed both flight and ground operations smoothly even under these adverse conditions. After proving the effectiveness of this system in the field, we have expanded this system to a total of 12 airports, including the Istanbul Airport in Turkey and the Turkish Republic of Northern Cyprus Nicosia airport. The Turkish Airlines Operation Control Center can actually see almost all air traffic in Turkish Airspace through OpsEye™. We also integrated the system to Istanbul Airport before it was opened. Currently, the most important airports in our country, where Turkish Airlines operates, are equipped with this system. As I have already emphasized, we provide real-time information about flight and runway traffic at the airports covering all the Turkish Airspace.

For OpsMet™, we can say that it is the first of its kind. OpsMet™ was also developed upon the demand of Turkish Airlines. As you know, Turkish Airlines has the highest number of destinations in the world and therefore needs meteorological knowledge. When you fly to that many destinations, you are in serious need of meteorological information about the airports that you are flying to and from. Turkish Airlines requires analysis such as which day and at what time of day it

would be more appropriate to fly to airports where it does not operate every day or what time of day it will get a suitable slot. When we consider the concept of big data, this information actually exists somewhere. When it was first requested, we collected this data from open sources starting from 1999. We created the historical meteorological data of all the airports Turkish Airlines flies. This study formed the basis of our Big Data. We added this into our big data analytics platform called OVERA, analyzed it, and based on the historical data we have; we developed an application that will provide Turkish Airlines with the required information for the best time to land and take off at these airports. Using this data, for example, Turkish Airlines send a more experienced team to an airport even if it was difficult to get a slot when the weather was seasonally bad. Therefore, when planning its operations, Turkish Airlines takes the necessary measures to turn unfavorable conditions into benefits and is satisfied with this product. Until now, we have analyzed this data and presented this product to Turkish Airlines, and now we have received a second project from Turkish Airlines. To date, we have been evaluating and reporting from the METAR (Meteorological Aerodrome Report) data. Now using the TAF (Terminal Aerodrome

Forecasts) data, we are advancing to the second phase of OpsMet™. In other words, our pilots will no longer make estimations with only the historical information of airports. They will receive real-time information about their destination and take action according to forecasts for up to 24 hours. The project has grown considerably since the beginning of the project. What they requested from us at the time was the 270 airports, which were part of the Turkish Airlines' program. Today, this number has reached 775 airports with the addition of reserve airports. Thanks to this project, we are now able to provide the meteorological data of the existing airports where Turkish Airlines land, including the other alternate airports. Furthermore, we offer OpsMet™ as Software as a Service. In this context, this service can be positioned very quickly and turned into a benefit. We take great pride in this project. As one of the world's leading airlines, Turkish Airlines states that there aren't any similar systems to OpsMet™ in the world. Therefore, we need to position OpsMet™ not only in the domestic market but also in the foreign market. We continue our studies on this matter.

 Aviation Turkey: You mentioned that you could see almost all of Turkey's airspace, and this system has been put into use in 12



airports, including Turkish Republic of Northern Cyprus. There are over 50 airports in Turkey. Is there any work planned to expand the OpsEye™ system to cover all airspace?

Ömer Korkut: The airports where this system is installed are highly busy airports. Installing such a system at an airport with two or three flights per day may not be very cost-effective. There are not any additional orders for now. But if there is a demand, it may come not only from Turkish Airlines but also from the public sector, especially from the State Airports Authority (DHMI). As STM, we have always developed our products first for military use and then transferred these products to the civilian side. OpsEye™, on the other hand, is a product that we have developed for the civilian side and then a capability that we could adapt to the military side. We are in contact with the relevant units of the Turkish Armed Forces. If there is a need, we will continue our efforts to install similar systems there.

✈️ Aviation Turkey: Especially for OpsMet™, there is a need for a certain amount of time to prepare for operations at airports, and you provide the user with an optimum output as a result of the analysis of big data obtained from the past to the present. Can you elaborate on that a little more?

Ömer Korkut: Extremely critical algorithms run behind this application. There are models on the back, and these models do not occur by chance. We build these models; we're talking about 20 years of data here. The whole story started with a specific "case" that Turkish Airlines had experienced. They gave us a date from the past and asked how the weather was at a particular airport at a specific time. We gave them the answer using this app. After this example study, Turkish Airlines decided to start this project. What I mean is; when you have the data with specific models after processing 20 years of big data, you also acquire the chance to confirm the results of your

models. For example, how was the weather in Ankara on October 25, 2006? Was there fog in the morning at 6 o'clock? When you draw a conclusion with the model you have installed, you can go and look at the data at that date and prove the accuracy of that model. We have something like this, and you can both increase and confirm the accuracy of your predictions. Now, especially with the addition of TAF to OpsMet™ (because the TAF is continuously being updated), even this option will be possible. Let's say there is a change in the weather forecast from 6 hours ago, and the storm has changed direction. The weather forecast will be updated immediately with new estimates, and this application will provide decision support and flexibility to the pilot to change the course of the plane while still in the air.

✈️ Aviation Turkey: You have pointed out that OpsMet™ is a service provided through STM servers. Do you also provide a risk map interface to the user?

Ömer Korkut: There is not much of a retrospective risk map, but when the OpsMet™ is renewed with the TAF, these demands will, of course, be met. Because, when planning a flight, it will be possible to conduct this risk planning as weather events that could be experienced during that flight could change and that will also be seen as well.

✈️ Aviation Turkey: In Civil Aviation, it is highly essential to provide fast and efficient services to users, especially in logistics, repair, and maintenance. What kind of service do you offer to customers regarding the services and products you provide?

Ömer Korkut: To achieve this, it is necessary to install systems that can operate on their own and do not require much intervention, but of course, this is not enough. The aviation operation continues 24/7, and it needs to be uninterrupted. Likewise, the services that support it must be non-stop again. Therefore, we have positioned ourselves to provide 24/7 technical support in case of need

for Turkish Airlines for the services we provide, mission-critical services such as OpsEye™ and OpsMet™, which in my opinion, can become mission-critical with TAF integration. We use specific hardware, even if it is an off-the-shelf commercial product. We continuously update our software, considering both the needs of Turkish Airlines and developing technologies. Since these are near real-time services, as technology advances, these systems need to be updated with new technologies both for ease of use and to maintain this real-time capability. In this regard, our Civil Aviation Group closely monitors technology and takes the necessary measures by continuously monitoring the needs of Turkish Airlines. We currently have an engineer at the OCC. We have a colleague who works as a System Engineer within the Operational Control Center of Turkish Airlines, and we are in constant contact with him. Otherwise, it is not possible to deliver continuous satisfaction in such a critical task.

Aviation Turkey: In particular, we see that the Internet of Things (IoT), Big Data, and connectivity topics have attracted a great deal of attention in commercial aviation in recent years. In light of recent developments in the world, what would you like



to say about your approach and the studies conducted or planned regarding these issues?

Ömer Korkut: There are many areas where you can use the devices with the Internet of Things (IoT) in Civil Aviation. For example, you can use it for baggage tracking. When we think about aviation or security operations when we talk about IoT in the security of airports, tiny chips come to mind first, but IoT actually refers to even the security cameras. So, we shouldn't just look at the cameras as security equipment in the airport management. It is also possible to measure the effectiveness of operational services through cameras using advanced computer vision technologies. This is how it's done in metropolitan hospitals. Accordingly, we have some solutions in this regard. We share these solutions both

with the airline companies and the public institutions regulating them. We strive to develop solutions and provide services in this regard. The OVERA System, which we have installed and operated since 2015, is already a data analytics platform compatible with IoT. Therefore, to provide such solutions to the field in a very short time, both our technological infrastructure and personnel resources are already ready, and they are working on them.

Aviation Turkey: STM has significant experience in Cyber threats and Cybersecurity. In this context, you periodically publish a Cybersecurity report every three months to raise awareness. Additionally, you provide cybersecurity training to institutions and organizations at STM Academy. Furthermore, you provide services to defense

and security companies on Cybersecurity in your Cyber Fusion Center. We see that cyber threats against Civil Aviation are increasing every day. Considering the recent global practices in this field, what would you like to say about the current level of awareness in Turkey regarding all the institutions and partners?

Ömer Korkut: There is a concept called Cyber Hygiene in Cyber Security. Cyber Hygiene comes with several other concepts. One of them is the attack surface. First of all, we need to narrow the attack surface. So, what is the attack surface, you may ask? You need to think of Civil Aviation from end to end. As STM, our understanding of Cyber Security is as follows; firstly, it should be integrated. If there is a system, all the parts of this system should work in the same center,

INTERVIEW

within a Cyber Security concept with defined principles. The second one is depth. Cyber Security starts with the passenger. Civil Aviation is regulated by very strict rules; there is even a phrase for that "The rules of Civil Aviation are written in blood." Despite this, we work with people in numerous places, and there is a possibility that these people make mistakes. As you know, planes have embedded systems. However, although they have been examined in detail, there are also potential vulnerabilities in the embedded systems of aircraft. We can't ignore that. Platforms are another factor when we talk about cybersecurity, and there are also additional systems integrated into this platform, which do not have their own built-in embedded system. Certain problems may also occur because of these systems. Of course, the flight operation is not limited to the platform. Within the flight operation, there are various parameters, including the airports and personnel working there. In other words, the operation is carried out with a combination of several parts. Therefore, a holistic perspective is needed to ensure the safety of the flight, the airports, and the airport operators. Thus, within our capabilities, we share our findings and assessments regarding this need by providing a kind of consultancy



service on what can be done from this perspective, especially in our work with the General Directorate of Civil Aviation (DGCA). Of course, we gain ideas about what to do with the data we receive in the field, and we are continually working to improve our capabilities and reflexes here.

Aviation Turkey: Is there any plan to conduct a pilot study with the participation of all partners?

Ömer Korkut: We are currently working on this with the DGCA. We conducted a pilot study and presented the reports to them. Moreover, we intend to conduct similar studies in the future by changing and improving its scope in ways the DGCA will deem appropriate. Of course, as I said, there will probably be measures that the DGCA will take considering certain processes. I believe the DGCA will evaluate this in the best way possible.

Aviation Turkey: The Cyber Fusion Center has a vital mission on this matter

to eliminate this threat before it emerges, on the other hand, STM Academy closes a critical gap in terms of eliminating the insufficiencies in education on cybersecurity. What can you say about the place of these issues within the holistic approach you have mentioned earlier?

Ömer Korkut: Cyber Security starts with awareness. In other words, if you do not establish a security awareness in the airline business, it is not possible to solve everything with technology. As we have always talked about, there are three pillars of effective cybersecurity, one of which is technology, and perhaps the most straightforward part is technology; the second is human, and the third is the process. All the on-line persons inside a network, from the most authorized to the least authorized, should be aware of Cyber Security within a specific framework. Because Cyber Security is not just network security, Cyber Security starts with physical

security. If an unauthorized person can physically access a network that should not be physically accessible, that means there is no physical security there. Physical security is actually a precondition for Cyber Security in this case. We are talking about a broad userbase here. Thus, specialized training must be provided to create this awareness. With the cybersecurity training we provide at STM Academy, we actually aim to accomplish this. Here, we provide not only awareness trainings but also a broad spectrum of trainings, including practical trainings for the technical personnel. As for the Cyber Fusion Center, we define three different functions here. One of them is Cyber Threat Intelligence, which means predicting events before they happen. In fact, the physical environment and cyber environment are very similar. When we encounter any security incidents in the physical environment, we always ask, have we not heard of this before? It

is also possible to predict and detect certain events beforehand in the cyber environment. That's what we do at the Cyber Threat Intelligence Center. We conduct both customer-oriented and sector-oriented Cyber Threat Intelligence by collecting global data from open sources and combining them with services from commercially available sources. Of course, it is not possible to detect all threats. That's when the Cyber Operations Center comes in. This is where we monitor our customers' networks. Here we evaluate the abnormalities in the system and decide whether they are a cyber event or not. If we encounter a cyber incident, we also provide services in the form of prevention and blocking. Our third functional area is our Malware Laboratory. After the incident, this is where the malicious software is examined, analyzed, and the problems it may cause are revealed; moreover, the measures regarding their elimination are recommended to our customers, and reports are written on this subject. We aim to position the Cyber Fusion Center on this triple structure and provide services to every sector. Cyber Security is a horizontal sector. Not only the defense or civil aviation sectors but also the health, transport, energy, and any other industry where information

technologies are used, need cybersecurity. We are trying to provide this service together with our Civil Aviation solutions and services.

Aviation Turkey: The technology in the field of Civil Aviation is improving every day. What would you like to say about your investments in R&D in the field of civil aviation and your upcoming products and new technologies?

Ömer Korkut: STM invests heavily in R&D, and sometimes R&D investments trigger each other. There are also cybersecurity applications in the field of civil aviation security that use artificial intelligence and big data. In other words, we are constantly working to develop new products by using artificial intelligence, machine learning, and big data analytics technologies and use them in the civil aviation industry. We aim to implement innovative technologies and turn our solutions into service. This is our current strategy.

Aviation Turkey: STM participates not only in defense fairs but also in civil aviation organizations as well. Furthermore, you represent our country by participating in various organizations in Turkey and abroad. In this context, what would you like to say about the activities you attended in 2019 and your plans for 2020?

Ömer Korkut: We participated in Teknofest in 2019. As it was planned and named, Teknofest was a spectacular event in which we displayed our aviation products in a festive atmosphere. Apart from that, we participated in international fairs both as visitors and exhibitors and introduced our products and capabilities. On the international level, we're going to Aircraft Interiors Expo; however, this event is mainly about platform interiors. Each year, we participate in the EFB Users Forums, where a wide range of EFB user, provider and integrator community can discuss and share current topics of interest. We consider that participating in fairs and events such as The Aviation Show MEASA 2019 in Dubai, which we have recently visited as a participant, will be more beneficial for the promotion of our products. Therefore, we plan our participations in 2020 in line with this consideration.

Aviation Turkey: Mr. Korkut, do you have anything else you would like to add or have a message for our readers?

Ömer Korkut: My message will be about Aviation Turkey Magazine. In our country, civil aviation is open to development, and serious investments are made in this field. We say that Turkish Airlines is the youngest fleet in the world. We say that Turkish Airlines flies to most destinations in the world. We say that we have built one of the largest airports in the world. Therefore, I believe that Civil Aviation has enormous potential and deserves more attention due to the geographical location of our country. In this respect, I think that Aviation Turkey magazine will fill a significant gap, even if it has just started publishing. Consequently, I would like to thank you for taking such an initiative. Similarly, I would like to state that we are ready to contribute both to the sector and to Aviation Turkey not just as an industrial organization or as a defense industry company but in every possible way.

Aviation Turkey: Mr. Ömer Korkut, thank you again for your kind words and for taking the time for us... 🙏



Cem Akalın and Ömer Korkut



Assist. Prof. Dr. Tamer Saraçayakupoğlu
Mechanical Engineer

Additive Manufacturing Technologies in the Aviation Industry in Pursuit of Weight Optimization

Digitalization is an important evolution for the aviation industry. Implementation into the new technologies has many benefits such as reducing a company's overall costs and increasing revenue. In this manner, the report "Digital Transformation Monitor, Industry 4.0 in Aeronautics: IoT Applications" was released in June 2017 by the European Commission. In accordance with the mentioned report, in the aviation industry, the expected impact of digitalization is a reduction of - 3.7% in costs and an increase of + 2.7% in revenue annually (EC, 2017). Emphasizing the huge budgets of the aviation industry these percentages mean a lot in the name of savings. So, it can be said that digitalization is rapidly impacting the manufacturing world in the aviation industry and it will continue to do so.

Regarding the International Civil Aviation Organization (ICAO) "2016 capacity and efficiency report" air traffic has doubled in size once every 15 years since 1977 and will

continue with this trend in the future (ICAO, 2016). Also, the International Air Transport Association (IATA) declares that 8.2 Billion people will fly in 2037, which means that there's an increasing demand from customers to fly more frequently on a global level (IATA, 2019).

This customer demand will force the aviation industry to increase their budgets. As it was mentioned before, aviation grade materials are manufactured by using highly engineered techniques, hence these materials are generally not cheap. The issue of reducing wastage and decreasing the scrap ratio is crucial. Consequently, lower wastage and lower scrap ratios are essential for fierce competition. Traditional CNC machining processes are subtractive techniques, and the material wastage could be as high as 98% (Allen, 2006).

When we talk about waste, the term "Buy to fly ratio" must be known and understood. Buy to fly ratio is a term used in the aviation community, referring to the weight ratio between a finished



A highly curved part is being manufactured with an Additive Manufacturing Process

component and the original raw material. The parts manufactured by traditional methods normally have buy to fly ratios at around 15-20 (Arcam, 2019). With AM technologies, the buy-to-fly ratio can be as low as 1:1. (Barz A., 2016). For example, with the Lockheed Martin engine bleed air leak detector bracket, the buy-to-fly ratio is reduced to 1:1 based on an electron beam melting method, as against the 33:1 ratio possible by traditional subtractive methods, leading to an overall 50% savings in the cost of the titanium alloy (Dehoff R, 2013).

Besides, scraps can be as low as 10%, part cost reductions can be as low

as 50%, time-to-market can be as low as 64%, part weight reductions can be as low as 64% compared with traditional machining process (Deloitte, 2014).

These benefits make the additive manufacturing technologies unbeatable in the aviation industry. Since aviation grade materials are expensive, companies in the aircraft industry are under constant pressure to reduce wastage and develop manufacturing techniques that produce parts in near net shape (Alberto Garcia-Colomo, 2019). Additive manufacturing is a novel and disruptive technology which opens new windows in areas of weight reduction which is essential for

the aviation industry. Additive Manufacturing Technologies are changing the paradigm of manufacturing techniques in the aviation industry.

The categorization of additive manufacturing techniques

AM techniques based on the conversion of three-dimensional geometries into simple two-dimensional layers and manufacturing them by using direct digital manufacturing (DDM) methods. It is possible to manufacture complex parts which may be too difficult or even impossible to produce by using conventional subtractive techniques such as turning and milling machines.

The additive manufacturing is accepted as a revolution in the manufacturing world. It has been extensively engineered and it enables the production of complex parts in a net shape. Including the assembled parts, the flexibility of additive manufacturing is expanding the boundaries of production.

A standard has been released by the American Society for Testing and Materials (ASTM) for categorizing AM techniques which is called “Standard Terminology for Additive Manufacturing

Technologies, Designation: F2792 – 12a” (ASTM, 2013). This standard mainly classifies the AM techniques in 7 categories as binder jetting, directed energy deposition, material extrusion, material jetting, powder bed fusion, sheet lamination and vat photo-polymerization. It is worth noting that each additive manufacturing process has its own unique specifications as it is represented in Table 1. The materials differ from one AM technique to the other one. For example, wax-like materials can be processed with material jetting and binder jetting. Metals such as nickel-based alloys and aluminum can be processed with directed energy deposition. Thermoplastic filaments can be processed with Material Extrusion. With powder bed fusion, polymers, maraging steel, stainless steel 316 L, 15-5PH, 17-4PH, nickel-based superalloys, Inconel 718, Inconel 625, Hastelloy X, Titanium TA6V, chrome-cobalt, aluminum ALSi10Mg can be used as raw materials. Adhesive coated papers, metal tapes and foils, plastic sheet material can be processed with sheet lamination and light curable resin and photopolymers can be processed with Vat Photo-polymerization.

Additive Manufacturing Categorization Table				
Process Name	Abbr.	Process Method	Process Method	Processing Material
Binder Jetting				
1.a	Binder jetting	BJ	Joined with Bonding Agent	Gypsum, sand and metal
2	Directed Energy Deposition			
2.a	Laser Engineering Net Shape	LENS	Fused With Laser	Metal
2.b	Electron Beam Additive Manufacturing	EBAM	Fused with Electron Beam	Metal
3	Material Extrusion			
3.a	Fused Deposition Modelling	FDM	Filament Melting	Composite and Plastic
	Fused Filament Fabrication	FFF		
4	Material Jetting			
4.a	Material Jetting	MJ	Cured with UV Light	Plastic
4.b	Nano Particle Jetting	NPJ	Cured with Heat	Metal
4.c	Drop on Demand	DoD	Milled to Form	Wax
5	Powder Bed Fusion			
5.a	Multi Jet Fusion	MJF	Fused with Agent and Energy	Plastic
5.b	Selective Laser Sintering	SLS	Fused with Laser	Plastic
5.c	Direct Metal Laser Sintering	DMLS	Fused with Laser	Metal
	Selective Laser Melting	SLM		
5.d	Electron Beam Welding	EBW	Fused with Electron Beam	Metal
6	Sheet Lamination			
6.a	Laminated Object Manufacturing	LOM	Material Cutting	Composite and Paper
7	Vat Photo-polymerization			
7.a	Stereolithography	SLA	Cured with laser	Plastic
7.b	Digital Light Processing	DLP	Cured with laser	Plastic
7.c	Continuous Digital Light Processing	CDLP	Cured with Led and Oxygen	Plastic

Table 1. AM Categorization Table (Farinia, 2019) (3dhubs, 2019)

TECHNOLOGY INSIGHT

The material selection is based on the customer requirements and there are some hybrid methods as well.

Conventional methods prior to additive manufacturing

Aviation is a highly engineered industry with strict manufacturing requirements. The materials used in the aviation industry are complex and high-tech matrix materials. As such, generally even one chip left after a machining process has a valuable price. Because of its high-tech requirements, aviation has been forced to become a pioneer for the implementation of novel manufacturing techniques and newly developed materials. For example, Computer Aided Design-Computer Aided Manufacturing (CAD-CAM), and carbon fiber composites were initially adopted by the aviation industry (Stratasys, 2017).

On the other hand, as a disruptive and innovative technology additive manufacturing is rapidly impacting the manufacturing world. Additive manufacturing can be seen as the “Great Renaissance” of industry, with its no tooling, no cutting, no heat affected zone (HAZ) and relatively less wastage and less scraps comparing



A chip-away process a milling machine cutting the block material

with subtractive manufacturing technologies. It is worth emphasizing that there are four main types of manufacturing. First are the subtractive and chip-away techniques like milling and turning. Humankind is very familiar with subtractive technologies since the producing of chipped-stone tools like axes, cleavers etc. Because

voluminous metal parts are designed for CNC machining operations, the traditional machining processes such as milling and turning are still in the aviation industry.

The second is the forming process which a block or sheet that is formed by force. The forming process starts with a block or sheet of material, but this time a force is applied in

order to shape the block or sheets. Forging, sheet metal forming, rubber-pad forming are the typical forming processes.

The third one is casting. In this process a raw material which is in solid form is transformed to liquid, generally by applying heat. Then the liquid material is poured into a shaping device which is called a mold.



Sheet metals are formed by a former tool.

Additive manufacturing technologies are changing the paradigm in the aviation industry

Airplanes can only fly with airworthy and airborne parts. Airworthy part certification is granted by airworthiness authorities only. Because of the design freedom upon complex parts available with AM techniques of the airworthy parts which are used on the airplanes are perfect applications (Matthew Tomlin, 2011).

Additive manufacturing gives advantages of weight reduction and process time savings. For example as an iconic part, the Leading Edge Aviation Propulsion (LEAP) fuel nozzle which was manufactured by GE was made combining 20 parts into one, manufactured in a single machine and weighed 25% less than the conventionally produced (3dprintingmedia, 2019). It is reported that these nozzles are 5 times more durable than those were manufactured by using legacy manufacturing technologies such as milling and turning processes (GE, 2019). Until now approximately 35.000 nozzles have been manufactured and it is announced by GE sources that the total



Melted material is being poured into the shaping mold in the casting process

number of manufactured nozzles will be around 40.000 by 2020 (Gorelik, 2019). The mentioned nozzles are used in CFM 56 engine. These engines are powering the almost the half of the Boeing 737 and Airbus A320 family. In other words, since the Boeing 737 and / or Airbus A320 are widely used in the fleets, in recent years many airplanes are flown with an additively manufactured fuel nozzle. It is worth emphasizing that the additively manufactured airworthy parts are penetrating into the aviation industry rapidly.

The Structure of Additive Manufacturing Process

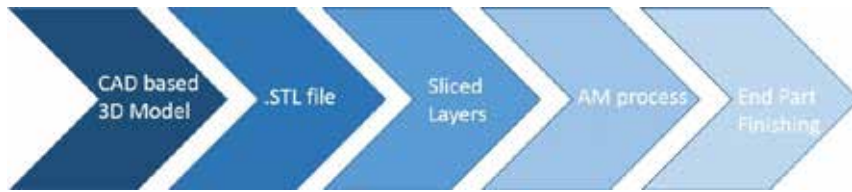
Additive manufacturing technologies are allowing the manufacturers to go from CAD file to end-

part. While using AM techniques, the core of the whole process is creating a CAD model. The CAD model, initiates the whole process (Liou, 2007). In Figure 6, the CAD model (as an initiator) and the following steps of AM process are shown in consecutive steps.

The AM Technologies require a solid CAD model of the part or assembly to be produced, the companies had to introduce solid modeling systems for creating the CAD files into the production process. CAD model is always ready for to be manipulated



GE's fuel nozzle which is additively manufactured for LEAP engines (Image courtesy of GE Aviation)



The steps of AM

for fine-tuning. STL file can be described as “triangle-mesh” of a solid CAD design. Each triangle consists of 3 vertices and 1 normal. A CAD file differs from STL file in several ways. A CAD file is defined by its parameters whereas an STL file is defined by triangles made of vertices and normals. A CAD file therefore is more precise while an STL file is more or less a loose approximation of the original design. Since CAD files are focused on traditional manufacturing it does not include any information about inside or outside of the part to be produced while an STL file does contain this crucial information (Materialise, 2019).

Later on STL file is converted for layer-by-layer manufacturing technique. After manufacturing sometimes post-process activities may be required for having precise surface and heat treatments etc. The one of the main subject must be emphasizing that during these steps there's no support tooling and there's no fixtures either.

The weight reduction studies using additive manufacturing applications

While reducing the weight of a part, maintaining the same mechanical features as its traditionally produced predecessors is vital. Additive manufacturing is relatively new technology in the aviation industry comparing with traditional manufacturing techniques. ICAO as an airworthiness authority, takes attention for emerging technologies may impact the aviation safety negatively (ICAO, 2018).

Redesign is the core of weight reduction studies, such as GE's nozzle which was mentioned previously. Redesigning of the nozzle gave chances to reduce operational man and machine hours and simplifying the manufacturing process, thanks to AM techniques (Mélanie Despeisse, 2015). Another redesigning project is the “SAVING”

project. By redesigning the seat buckles using AM techniques, the “SAVING” project elucidated that 55% weight reduction is possible compared with original design. Weight reduction was almost a total 72,5 kg can be saved if all the seat buckles of the Airbus 380 which 853 seats were to adopt the optimum designs, amounting to 3.3 million liters of fuel savings over the service life of the aircraft.

Reportedly, total saving is \$3 million while the cost of making the buckles using Direct Metal Laser Sintering (DMLS) is only \$256,000 (Sarat Singamneni, 2019), (B. Dutta, 2017)).

The reduction of one kg built-in aircraft weight is able to reduce carbon emissions by 0.94 kg for the case of the Boeing 747-400 whose Maximum-Take-Off-Weight (MTOW) is 396,890 kg and by 0.475 kg in the Airbus A330-300 whose MTOW is 242,000 kg.

(Wen-Hsien Tsai, 2014). The lighter aircraft means

less carbon footprint. At the conclusion, the weight, the carbon emissions, the fuel consumption, and the operational cost are interrelated with each other. e.g., reducing one pound of weight from each aircraft in American Airlines' fleet could save about 11,000 gallons of fuel annually (Lyons, 2011).

Thanks to AM and TO studies, European Aeronautic Defense and Space Company (EADS) redesigned the nacelle hinge brackets of Airbus A320 the brackets weight saved up to 64% while keeping the mechanical features satisfactory (Weihong Zhang, 2016).

Besides weight reduction AM technologies are always-ready for maintenance periods in Part 145 certified shops. That's why there are collaborations in the aviation maintenance, repair, and overhaul (MRO) area. During MRO stages aircrafts don't fly and whenever an aircraft is not flying, it means wasting money for airline companies. Aircraft-On-the-Ground (AoG) is an unwanted situation as it is said “aircraft in the sky makes money, aircraft on the ground takes money”. Airbus China estimated that a grounded A380 Airbus costs \$1,250,000 every day; and when you consider the implications of this for an entire fleet,

the scale of the issue is significant (itportal, 2019). For shortening the ground-time and preventing waste of money, there are some collaborations in the MRO field. e.g. Etihad Airways Engineering, which is the largest aircraft MRO services provider in the Middle East and EOS which is a leading innovation supplier in the field of industrial AM have agreed on a strategic partnership which is a significant mutual relation (EOS, 2019). Shortening the maintenance intervals is a target and in the MRO area, and some other collaborations are underway such as the collaboration between Emirates Engineering and 3D Systems. The Airbus and Boeing aircrafts' video monitor shrouds are printed by 3D Systems using flame-retardant nylon-12 thermoplastic material. Shrouds are now 9-13% lighter than the original ones. The other examples of MRO area are the Airbus and Belgium based Materialise company (Materialise, 2019), Airbus and Singapore based SIA Engineering Company (SIAEC) (Airbus, 2019), and Airbus and Stratasys (Stratasys, 2019) collaborations. In the military side, LM and Sciaky manufactured a flaperon spar made



Yellow sphere is a CAD file while green sphere is an STL file

through AM Electro-Beam Direct Melting (EBDM) process could save about 100 \$ million thru the lifetime of F-35 (Fabricator, 2019). Research collaborations between aerospace institutes and universities such as LM and ORNL, BAE System and Cranfield University, NASA, Honeywell, and Ohio Aerospace Institute, and many others are currently active and evaluating various possibilities for the application of additive manufacturing for the aviation industry (Sarat Singamneni, 2019). In August 2012, the USA AM Innovation Institute was established in Youngstown, Ohio, with the participation of 46 large business and 62 small businesses companies, 40 academic organizations (universities, community colleges, and research institutions), 14 government organizations, 11 non-profit organizations and 4 Manufacturing Extension

Partnership (MEP) centers (Manufacturing USA, 2016). Since a forementioned collaborations will assure the part consolidation, reduced inventory and less storage fee, on-demand manufacturing, lightweighting reduced costs, lower fuel consumption and eventually smaller carbon footprints, it seems that in the future there will be more all-parts-win collaborations in the aviation industry.

Although it may seem that additive manufacturing technology is a neutral extension of the rapid prototyping, nowadays it is not the case. Many additional considerations and requirements have come into the theater for manufacturing that are not important for prototyping.

Additive manufacturing technology has a history of almost three decades, starting with rapid prototyping studies (Jakus, 2019). Up to date,

many parts have been additively manufactured in the aviation industry. Many of them are flying on the military aircraft, commercial aircraft and even space shuttles.

Conclusionally, the capability of processing the aviation grade material in an additive manner will disruptively change the industries and produce new parts that could not be manufactured using traditional techniques. This will have a lasting and profound impact upon the way that the parts and assemblies are manufactured and distributed, and thus on society as a whole.

The aviation industry has been sparked by the imagination of the aviators and now opportunities for development are bounded only by the creativity of those using additive manufacturing technologies 🚀



by Saffet Uyanik

Performing Better and Faster – Drones Becoming Fundamental in Many Businesses

Originally viewed as a piece of sophisticated military technology or a hobbyist's tool, the Unmanned Aerial Systems (UAS) industry, with a US\$14.1 billion global market value, has established a presence in the corporate world over the past years. As innovators explore new uses, businesses across industries realized that drones have multiple commercial applications, some of which go beyond basic surveillance and recording purposes. In particular, the dull, dirty, or dangerous jobs.

Expanding rapidly in recent years, the commercial use of drones, also known as Unmanned Aerial Systems (UAS), presents new opportunities to businesses and governments for commercial and recreational purposes. Initially viewed as sophisticated military technology, the commercial use of drones has increased dramatically due to their ever-expanding capabilities. Businesses around the world have increasingly turned to drones for a variety of commercial applications, and they are already using them to transform some industries. UAS technology can help to accomplish time-consuming and challenging tasks while reducing costs and potential risks. There is a growing trend to adopt drones to replace existing solutions that involve humans, such as inspection of powerlines or wind turbines. Over the past few years, drones have been utilized in certain sectors, most notably construction,

agriculture, and insurance. As useful tools for engineers, drones can reach remote and difficult to access areas quickly and provide data for an overview of a given situation. Drones serve as an extension of the operators and assist the accomplishment of various tasks as promptly as possible, saving time, personnel, and money. Insurance companies use drones to inspect damaged assets, and farmers use them to monitor crops and collect soil data. Drones are also utilized for the monitoring of livestock and locating missing persons.

As technology evolves and matures, innovators explore new uses. Drones with mission-specific payloads are also used for delivering lab samples from medical clinics to hospitals or to perform accident prevention and response to offshore refineries.

In addition, leading tech giants like Amazon heavily invest in drone services such as drone taxis and drone deliveries, while some companies focus on providing Internet connection to remote areas with specially equipped drones. According to The

Library of Parliament (the main information repository and research resource for the Parliament of Canada), drones used for recreational purposes currently represent the largest civilian market in terms of the number of units sold; however, commercial drones are projected to be the fastest-growing segment of the civilian market in terms of revenue. It is estimated that 74% of the drones sold are used for recreational purposes, and 26% are used for non-recreational purposes. The American multinational investment bank and financial services



DJI M200 Series

company, Goldman Sachs Group, predicts that military, recreational, and commercial drones will represent a US\$100 billion market opportunity between 2016 and 2020. Supporting this statement, according to the Association for Unmanned Vehicle Systems International (AUVSI), the drone industry in the U.S. will result in the creation of about 100,000 jobs and have a US\$82 billion impact on the economy by 2025.

Another potentially immediate economic impact of the drone industry comes in the form of job creation. As commercial drone usage increases, the number of operators and technicians will also increase accordingly to maintain this billion-dollar industry. According to Global management consulting firm McKinsey & Company, the United States is a particularly strong source of commercial growth, with the value of drone activity rising from US\$40 million in 2012 to about US\$1 billion in 2017. Thanks to the increasing interest in commercial drone usage, start-ups have attracted more than US\$3 billion in funding for new UAS applications, while OEMs have received almost half that amount of around US\$1.4 billion. By 2026, McKinsey estimates that commercial drones will have an annual impact of US\$31 billion to US\$46 billion on



the country's GDP, and the developments within the United States could signal how commercial drone usage and investment will proceed in other markets.

Present uses of commercial drones

As the commercial drone industry continues to evolve, widespread drone-based usage is transforming business models across sectors. According to the Federal Aviation Administration (FAA), 2.85 million small drones could fill the sky by 2022, and 450,000 of them will be used for commercial purposes. The current application areas of drones are virtually limitless. From wildlife conservation to disease control, emergency response to insurance, UAVs are being used in multiple sectors. Among promising applications are crop monitoring, construction site management, search-and-rescue operations, surveying, and firefighting. The ability to safely and quickly gather data and

to access inaccessible locations opens a world of possibilities for drone use.

Agriculture and Monitoring

Agriculture is one of the most crucial elements for the sustainability of human civilization. With the advancement of new technologies, agricultural drones help to achieve and improve what's known as precision agriculture. Precision agriculture is a farming management concept that uses drones for agriculture to measure, observe, and respond to variability found in crops. In precision agriculture, drones have a range of uses, from soil and crop

field analysis to planting and pesticide spraying. Drones with different imaging technologies like hyperspectral and multispectral cameras can be used to provide time and site-specific information regarding crop health. Drones can also identify drier regions in a field, to determine and irrigate such areas with better techniques. The drones save farmers money by helping them identify failing plants early and mapping and studying the farmland and its irrigation systems. The drones can also be used to monitor the livestock and quickly gather and track useful data about animal health and population.



DRONE TECHNOLOGY

There are multiple uses for agricultural drones, including:

- Soil and Field Analysis
- Seed Planting
- Checking for weeds and spot treating plants
- Monitoring overall crop health
- Managing livestock and monitoring for health issues
- Crop Mapping and Surveying
- Irrigation Monitoring and Management

Agriculture drones range from \$1,500 to over \$20,000 for a commercial-grade spraying drone. The agricultural drone market is expected to grow by over 38% in the coming years, driven by increasing declining costs of drone equipment, which offers a quicker return on investment. While spraying is carried out mostly by using a single drone, rapidly developing technologies within the drone industry may allow much larger areas to be sprayed in the future with drone swarms. Drones are already capable of communicating with each other, so this could enable a swarm of drones to apply pesticides across whole fields in the future.

Construction and architecture

Construction companies also benefit from the use of drones. Currently, the construction sector appears to predominately use drones for mapping, surveying, and

monitoring. By using a drone, architects can create 3D renderings of the structures they aim to build by quickly using the aerial shots and footage of a property. Thanks to this capability, architects can create real-world concepts of their projects. For the architects, this ability is indispensable in creating accurate designs. Additionally, the data collected during the drone flight can be used for land surveys, which allows the contractors to lower the working hours without going on foot and survey a property before the start of construction. Drones also help with monitoring the job's progress, which is quite a challenging task considering the site supervisors need to travel to multiple job sites to keep track of progress at each site. By monitoring workers in real-time, contractors can ensure that safety equipment is being appropriately used, eliminating potential accidents before they happen. Another aspect the drones can help with is construction company marketing. Drones in construction work can be used to provide marketing materials for contractors in the form of aerial imagery and video footage of the projects to attract new clients.

Engineering and inspections

Infrastructure is the fundamental facilities and systems serving a



Commercial grade spraying drone

country, city, or another area, including the services and facilities necessary for its economy to function. There are several reasons why using drones to solve infrastructure-related tasks is beneficial. Using drones for engineering and infrastructure inspections reduce both required personnel numbers, safety risks, environmental impact, facility downtime, and overall maintenance costs. Limiting the number of dangerous jobs and replacing the human workforce with unmanned drones where necessary will not only decrease the risks involved but will also reduce the environmental impact, considering the use of drones means less CO2 emission compared to the use of heavier machinery such as helicopters.

As an extension of infrastructure inspection, drones can be used for missions to support operations at power plants. Drones improve the safety while reducing the operational and performance costs. Inspecting large hard-to-reach boilers at power plants, assessing panels that are not operating correctly in solar farms, and getting an overview of after major

storms are both cheaper and safer when using drones. Another advantage of drones they can also be used for inspecting the electricity networks due to the long stretch of power lines in case of an extensive inspection over long distances. There are several advantages of using drones for inspecting high voltage power lines and towers. Equipped with a high-resolution camera, drones can fly along the approximately 7,000 km of power lines to register corrosion and other issues that eventually lead to critical malfunctions.

Consequently, drones have also started to be utilized by MROs and car manufacturers to inspect airplanes and facilities respectively. AAR Corporation, which provides independent aviation and expeditionary services, recently started a one-year trial using a Donecle drone for aircraft inspections at its Miami facility. The Donecle drones are equipped with the latest image analysis algorithms, which will assist the inspectors in the detection of defects and damages (including lightning strikes) on the surface of the airframe. This allows

demonstrations of various drones and is part of AAR's broader investment in MRO digitization. Because aircraft inspections done by drones are not yet approved by the FAA, AAR will spend the next year performing the task by drone and in parallel, by its current manual process, to gather data.

Similarly, Ford Motor Company also started to use drones to inspect its Dagenham engine plant in the UK. With the help of drones, Ford claims that maintenance staff can check each plant in 12 minutes. The company adds that the whole production facility can be covered in a day. Before using drones, the maintenance and safety inspections took 12 hours to complete, and the company used automated extendable platforms and scaffolding.

Delivery and cargo

Drones can already deliver mail and medicine to hard-to-reach places. However, Google and Amazon are making significant investments in drone technology to expand the reach of commercial drones. Drone-based delivery services constitute one of the most obvious applications, thanks to drones, early delivery of medical services in remote areas is currently possible.

While still restricted to a pretty low carry weight (25 kg, including the drone itself), delivery-by-drone is a promising application. Amazon's CEO Jeff Bezos was doubted about the feasibility of his planned Amazon Prime Air; however, the promise of delivering goods directly to customers' doors by drones will only become more real as the technology continues to evolve and its capabilities expand.

Commercial drone use in Turkey

Unfortunately, there is not any specific data that shows the exact distribution of commercial or recreational drones used by private businesses or public institutions. According to the Directorate General of Civil Aviation, there are 32,100 registered drones and 48,800 designated drone operators in Turkey. The most common drone model is the Chinese DJI drone, with over 80% market share. Unlike countries like the United States, the United Kingdom, and Canada, there are only a handful of private businesses in Turkey



which operate drones for commercial purposes. One of the biggest reasons is the DGCA classifies drones as aircraft, so every person who wants to use drones have to acquire a drone pilot license first. Another factor is since the drones are classified as aircraft; there are airspace restrictions bind them. Any drone heavier than 500gr cannot be used within 9km of airports or in closed spaces and cannot fly above 120m. Although not as common as some of the examples mentioned above, drones are mostly used for media coverage (over 70%), mapping, land survey, pesticide spraying, and wind turbine maintenance in Turkey. The most significant setback for commercial drone use in Turkey is the lack of investments and incentives. To give an example, in 2018, Joby

Aviation, a startup company in the United States, received more than US\$100 million investment while the total amount of investments and incentives in Turkey was less than US\$100 million. In any case, each of the tasks mentioned above requires specific technologies and drones, which hinders the full realization of the commercial drone market as we need to develop sophisticated drone platforms in different shapes and sizes. To increase the volume of commercial drone use and support the domestic drone industry, Turkey should encourage local startups and provide incentives for these companies. The key to the future of the commercial drone market is not only technological developments but also public acceptance and adequate regulation





Air for Startups: Why Small Companies Are the Future of the Aerospace Industry

The boom of startups in the aerospace industry began in 2010 with new initiatives from Elon Musk (SpaceX), Jeff Bezos (Blue Origin) and Bertrand Piccard (Solar Impulse) – all of them are successful entrepreneurs and incorrigible romantics. With a gleam in their eyes they started to argue that even smaller private companies can master the celestial industry on a par with huge corporations. Today it becomes clear: the aircraft industry is a blue ocean of opportunities for startups. New players not only offer innovative solutions, but also radically change the nature of the entire market.

Dreams and money

The aviation and space industry are becoming extremely attractive sectors for private businesses. It seems that in the coming years, it will be small innovative companies that will set global trends in this market. The industry is flooded with new players: according to the research company NewSpace Global, since 2013 the number of startups in the industry has grown almost tenfold - from 120 to more than 1,000. The dreams

of young engineers are generously supported by investments. According to the British venture fund Seraphim Capital, in 2018 alone, about \$3.3 billion was invested in aerospace startups. And in the period from 2012 to 2017, this industry has raised \$10.2 billion, which is three times more than ten years before!

According to Deloitte analyst Erich Fischer, the aerospace industry has practically not evolved over the past 25 years. Every second company

in this industry has not changed its strategy or business model and simply ignored the need to adapt to the requirements of the market and to the growing competition. That is why startups have every chance to catch up with the giants. Unlike the state-owned companies or large international corporations, small private companies use different approaches. They strive to reduce the final cost of their products and services in every way in order to make them accessible to a wide range

of customers. To do this, they have to work faster, they have to generate more innovations, they have to use cross-sectoral technologies and solutions. For example, it took SpaceX five years and \$400 million of investments in order to develop the carrier rocket Falcon 9, while NASA would have spent about \$ 1.4 billion for a similar task, as calculated at the agency itself.

Access to the sky

The aerial domain and space have become



available to startups when the entry barriers to the industry have been reduced. Over the past decades, technologies and various components have improved and become cheaper. As a result, private non-public companies are now present in almost every segment of the aerospace industry. The most rapidly developing trends in the aerospace industry are unmanned aerial vehicles, satellites, space communication systems, various services for maintaining space and aviation infrastructure, and finally, suborbital tourism.

For example, Chinese startups Space Transportation and Linkspace have recently successfully launched their reusable rockets – a cheap version of Falcon 9. The Swiss company Gamaya is building drones for agriculture and precision farming. The British startup OneWeb is already launching miniature satellites into the low Earth orbit – with its help by 2021 the company intends to provide high-

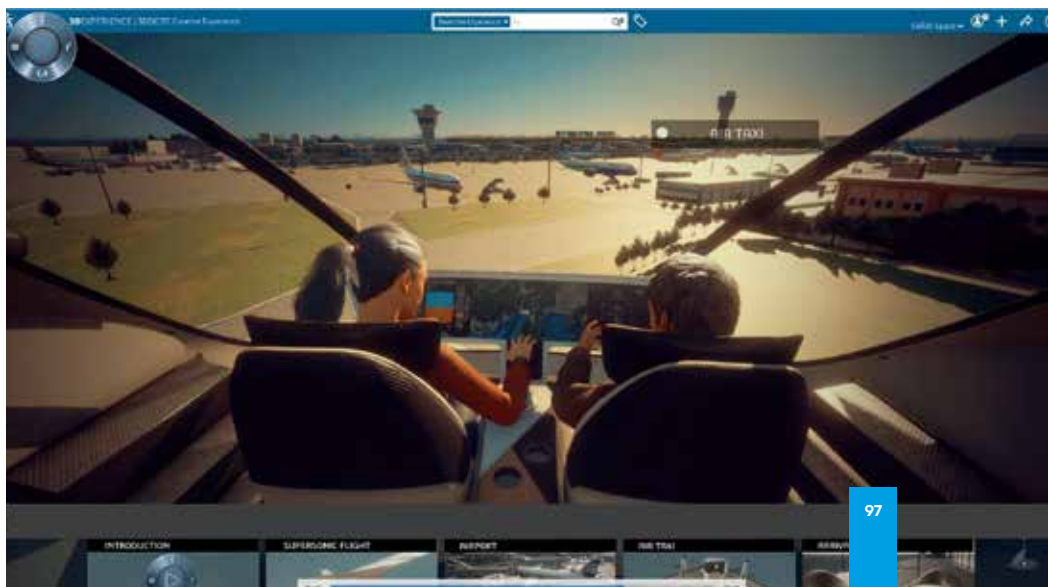


speed Internet access throughout the world. Another British company, Orbex, is preparing the commercial release of its Prime rocket, which is specifically designed to launch ultralight satellites. In 2023, it should put into orbit the nanosatellites of a Swiss startup Astrocast, which plans to deploy a global support network for the Internet of things. The Canadian company LEO will begin to provide a service for monitoring the chemical composition of the earth's surface, as well as tracking space debris in 2021. There are many such examples, and they all prove that private companies have moved from talk to action, from R & D and prototypes to commercial versions of products and

the deployment of services. Startups are not afraid to experiment, and as a result, new types of transport, new markets, and new categories of consumers are born right in front of our eyes. For example, Dassault Systèmes is working with Slovakian company AeroMobil that collects preorders for a flying car, capable of vertical take-off and landing (the first sample vehicle is expected to be released in 2020). It will be possible to move around in any terrain and in any weather: if the sky is clear, you rise into the air, if there is a thunderstorm, you move along the road. As they say in the company itself, developing such a project required the most, tight cross-sectoral interaction. After all, in

order to successfully pass certification, such a flight- and-ground apparatus should meet the requirements of regulators of both industries at once. But the emergence of this type of transportation will give impetus to the development of new related types of business – schools for drivers/pilots, flight-car service workshops and so on.

How do startups manage to compete on equal terms with big companies? The thing is they have exactly the same engineering and marketing tools as the market leaders. Today, startups use all the benefits of cloud computing, computer vision, Big Data, as well as business intelligence and digital IT platforms. For example, the



FUTURE TECH

American company Boom Technologies uses the 3DEXPERIENCE platform by Dassault Systèmes to accelerate the design and development of its own Overture airliner, a commercial aircraft achieving the speed of Mach 2.2, which will make supersonic flights ubiquitous and accessible. The same platform is used for ideation, production and certification of Airbus products. At the same time, startups win in terms of flexibility and mobility, the use of agile principles in product development, and the ability to find and occupy new niches in the market. That is the way they get a competitive advantage over large companies.

What's next?

The prospects are breathtaking, since we are talking about the massive use of the latest aerospace technologies, products and services. According to the Bank of America, by 2040 the volume of the international space market will grow from the current \$339 billion to \$2.7 trillion. Besides that, there is a huge market of commercial air travel, which, according to Boeing estimates, will reach more than \$2 trillion by that time. It is expected that in the coming years, private innovative companies from around the world will join the race.

Of course, market leaders do not intend to give



up their positions to new players. They also want to take advantage of the development of innovations by startups – and to achieve that they are creating infrastructure to grow such companies in-house, they acquire the complete teams and the whole technologies from the market, they create corporate venture funds and establish partnerships. For example, Airbus has its own startup accelerator, Airbus Bizlab, which has helped 72 external and 54 internal projects over the four years. Dassault Systèmes has its own international 3DEXPERIENCE Lab that helps startups develop the new concepts of next-generation air transport. Part of this project is the Xsun startup, which is developing new types of long-range unmanned aerial vehicles powered by solar energy. The company of the same “nest” – Zero 2 Infinity – is building an inexpensive and

environmentally friendly platform for launching small-sized satellites using stratospheric balloons. In 2017, Boeing launched its HorizonX venture capital arm, which tracks promising ideas and invests in them. Northrop Grumman, Lockheed Martin and Raytheon work closely with satellite startups – for example, Lockheed Martin has a stake in Terran Orbital, which offers satellite surveillance services to various government departments. This means that the number of startups and the rate of innovation will only grow.

However, the risks for such startups are also high – higher than in many traditional industries. Large test costs make mistakes too expensive. The dreams of the rapid introduction of new technologies and products to the market are confronted by high demands and time-consuming certification processes. In this sense,

the use of integrated digital solutions can substantially facilitate the life of innovative companies. In essence the Dassault Systèmes' 3DEXPERIENCE platform offers new ways for ideation, design, manufacturing, testing, certification and operation. This platform automates many routine operations, reducing time for projects. As a result, startups can accelerate their programs and be the first to bring their prototypes to market. The evidence from the practice shows that investments in digitalization pay off rather soon, in 6-18 months. Such solutions help startups to survive and become successful in this quite challenging market. Since to achieve these goals they need to carefully and efficiently manage resources, carefully choose partners, not only raise money, but also gain the knowledge and experience from experienced mentors, and, if possible, optimize all their business processes

Wishes



Suat Hayri Aka

Former Undersecretary, Ministry of Transport and Infrastructure

In the last fifteen years, the development of Turkish Aviation has been noteworthy. It is also an important requirement now to make this development effective and sustainable by integrating with the world.

The publishing of sectoral

periodicals are an important communication tool that provides information flow and plays an essential role today in the examination of past experiences, addressing the current situation and important issues and also sharing them with the general

public. This importance is directly proportionate to the globalization level of periodicals.

Based on these two dynamics, Aviation Turkey Magazine's capacity to benefit the Aviation sector in Turkey is remarkable and I wish them great success.



Can EREL

Chief Advisor to Editorial Board at Aviation Turkey Magazine

The importance of air transportation develops as globalization and the value of the individual increases, and the impact it has in shaping human life increases as well.

Turkey has become a rising star with the number and age of its platforms, along with the power of global access, and the development of an efficient and capable aviation infrastructure and production technologies.

Turkey is also becoming a regional star with systematic efforts in the field of fostering gender balance. In summary, Turkey is one of the best countries in terms of its adaptation to global transformation in aviation.

In parallel with this impressive situation and capacity, it was a decade-long dream to connect it with the world through the right communication channels. This dream has

started to come true with Aviation Turkey Magazine, helping to set the stage and make global communication even more effective, with its vision, mission and ethical principles.

As a senior aviation professional, I'm happy and honored to have made a direct contribution to the formation and implementation processes of this magazine, I wish great success to Aviation Turkey.



Gökhan Sarıgöl

Fly Service Turkey CEO

Dear Aviation Turkey Team, Publications in English are more important than ever before in order to announce the sectoral developments in Turkey on

a global platform. Aviation Turkey magazine has become the voice of our passionate efforts to carry aviation to a superior level with all my colleagues,


both in Turkey and abroad.

I wish you success in the publication life of your magazine and thank you for your contribution to Turkish Aviation.



Travel Experience Elevated to New Heights with Emirates

In this Interview, Emirates Airlines Turkey - Romania and Bulgaria Regional Manager Bahar Birinci discusses the progressive, competitive and continually global outlook that has made Emirates Airlines a pioneer in providing unique experiences for travelers, sharpening their competitive edge by leveraging cutting edge technology

 **Aviation Turkey:** First of all, thank you very much for this interview. Emirates Airlines began its aviation life with two leased airplanes 35 years ago and now it is one of the biggest players in the industry. Can you tell us

more about how Emirates Airlines has become so successful?

Bahar Birinci: On 25 October 1985, Emirates began operations with its first flight from Dubai to Karachi, Pakistan. The

airline started off with just two aircraft, a leased Boeing 737 and an Airbus 300 B4.

Then, as now, our goal was always to provide travelers with the best travel experiences on the ground

and the air, and in the years since taking those first steps from entering the regional travel scene, we've evolved into the world's largest international airline. We had, and continue to have, a strong focus on customer innovation and

over the years developed a range of services and products in the airline industry that were the first in the industry. As one example, in 1992, Emirates became the first airline to install video systems in all seats across all classes throughout its fleet.

Today we operate a fleet of 268 aircraft, comprising all Airbus 380s and Boeing 777s, which also makes us the world's largest operator of these two aircraft. Our global network currently covers 158 destinations in 85 countries across six continents.

Aviation Turkey: The Aviation sector is a growing sector that grows with each passing day. Emirates Airlines is one the biggest player in the giant's league. Can you tell us about the challenges of being listed as one of the best airlines and please share a bit about the investments you've made into technology as Emirates is known to always to lead the airline industry with trends of the future?

Bahar Birinci: One of the key challenges in the airline industry is to keep pace with constantly changing technologies. Over the years - and we continue to do so - we've made significant investments across all areas of our business, such as introducing new technologies, products and services, acquiring new aircraft and equipment, modernizing our facilities and staff initiatives, amongst others. All of these investments enable us to be at the forefront of providing our customers the best travel experience.

For example, we recently announced that Emirates is the first airline outside America to receive approval for biometric boarding from the U.S. Customs Border Protection (CBP). This means that soon customers flying from Dubai to any of Emirates' 12 destinations in the U.S. will be able to choose facial recognition technology at the departure gates, reducing the time taken for identity checks to two seconds or less. No pre-

registration is required, and customers may also choose not to use the technology.

We also continue to focus on elevating our digital customer experience by leveraging cutting edge technology. Last year, Emirates introduced 3D seat models, becoming the first airline to introduce web virtual reality (VR) technology on its digital platform. The 3D seat model is a visualization engine that displays an immersive 3D 360-degree view of the interior of the Emirates A380 and all the Emirates B777 aircraft types, allowing users to navigate through Economy, Business and First Class cabins, as well as the iconic Onboard Lounge and Shower Spa on the A380 using navigational hotspots.

Aviation Turkey: Emirates Airlines has nearly 130 Boeing 777s and 142 Airbus A380 aircraft which is the largest A380 fleet in the world. In the near future is it possible that you may add smaller aircraft to your fleet, such

as the A350, A330 or Boeing 787?

Bahar Birinci: Emirates operates a young and modern fleet with an average fleet age of just 6.1 years. While we currently operate an all A380 and Boeing 777 fleet, we do have orders for other types of aircraft. In February we placed an order for 40 Airbus 330-900 and 30 Airbus 350-900 aircraft in a head of agreement signed with Airbus. These aircraft will be delivered to Emirates starting from 2021 and 2024 respectively.

Aviation Turkey: As we know you have 18 weekly flights from both Sabiha Gökçen Airport and Istanbul Airport to Dubai and this is important for Turkish travelers flying directly to the UAE or transferring to the Far East. From Istanbul to Dubai you are operating the flights with B777s. On the other hand, you are operating the shortest flight of your Network; Dubai to Muscat with A380s. Do you have any plans for Turkey to operate with A380s?





Bahar Birinci

Bahar Birinci: We have no immediate plans to fly the Emirates A380 to Istanbul, but we continue to welcome many Turkish customers onboard these iconic aircraft when they connect in Dubai to one of our A380 destinations, particularly in Asia and Australia.

Aviation Turkey: Dubai International Airport, as one of the most important transport and logistics centers in the world, served about 90 million passengers in 2018. What part of this success can be correlated to Emirates Airlines?

Bahar Birinci: Dubai's rise as a vibrant, thriving global tourism and business city and Emirates' growth have always gone hand in hand. Emirates' growth to become the world's largest international airline is due to a combination of factors: Dubai's visionary leadership and forward-looking ethos, entrepreneurial spirit and successfully tapping into the city's geo-centric location to connect people and economies.

The city boasts a world class infrastructure, outstanding airports

and seaports, a financial hub and a world-class tourism industry. Dubai's aviation industry, which is a key part of this city's economy, is not only an important driver of growth in its own right, but it also underpins growth in other strategic sectors through the provision of essential global connectivity and air lift services.

Emirates has helped to grow tourism and link trade opportunities for Dubai to become a global hub by serving one-third of the world's population within a four-hour flying radius,

two-thirds of the world's population within an eight-hour flying radius, and almost 90% of the world's population with non-stop flights using the latest ultra-long-range aircraft.

Emirates will continue to contribute to the growth and status of Dubai as a global center for trade, tourism and commerce. Like Dubai, Emirates is progressive, competitive, has a global outlook and continually innovates to pioneer unique experiences for travelers and sharpen our competitive edge.

It's also just less than a year away when Dubai will host Expo 2020, taking place from 20 October 2020 to 10 April 2021, which is expected to attract millions of visitors.

Aviation Turkey: For a passenger that is planning a long-haul flight with Emirates Airlines, what do you offer in terms of comfort, technology and safety, what makes you unique?

Bahar Birinci: Our brand promise "Fly Better" is all about customers having a better experience when



© Emirates Airways

A380 Economy Class



© Emirates Airways

A 380 Business Class

travelling with us, whether you are in Economy, Business or First Class. All customers travelling with Emirates can look forward to complimentary regionally inspired cuisine and beverages, over 4,500 channels of entertainment on our multi award winning entertainment system, ice, warm hospitality from our multinational cabin crew, including Turkish nationals, generous baggage allowances, Wi-Fi on most of our aircraft and dedicated products and services for families.

Our Business and First-Class customers enjoy chauffeur transportation services in over 75 cities worldwide and access to a network of over 40 Emirates lounges. Premium cabin customers travelling on the A380 have access to the onboard lounge, while First Class customers have exclusive use of the shower spas.

 **Aviation Turkey:** In recent years, Cargo transportation has become more important for airlines. As Dubai is one of the biggest hubs between Europe, the Middle East

and Asia, can you tell us about the activities and future plans of Emirates SkyCargo?

Bahar Birinci: During the Financial Year 2018/19, Emirates SkyCargo transported close to 2.7 million tons of cargo. We are currently the world's largest international airline cargo carrier as measured by FTKMs (Freight Ton Kilometers). We fly cargo to over 155 destinations across six continents. In addition to the over 255 passenger flights every day from Dubai, we also have our freighter fleet that cover a network of over 40 destinations every week on a scheduled basis. Emirates SkyCargo has been able to navigate the global air cargo industry successfully thanks to a few key strategies.


The first is our focus on building specialized transportation solutions for industry verticals which has been important to our successful performance and it will continue to remain a priority area. Customers have been demanding specialized care and handling for

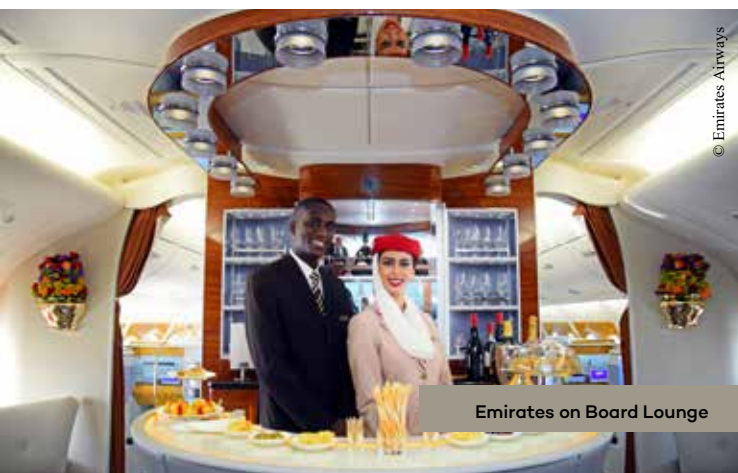
their shipments. Some of our flagship specialized product offerings include Emirates Pharma, Emirates Fresh and Emirates Wheels. In addition, in 2018/19 we launched Emirates AOG for the rapid transportation of aircraft components and Emirates Pets for the safe and comfortable journey (including door to door in select markets) for pets such as domestic cats and dogs. Some of our other products include Emirates Charter focusing on our charter solutions, Emirates Safe for the transportation of valuable and vulnerable cargo.

The second has been our strategy to invest in developing state of the art and 'fit for purpose' infrastructure both within and outside our hub. Between our two state of the art cargo terminals Emirates SkyCentral DXB and Emirates SkyCentral DWC, we offer a capacity of close to 2 million tons of cargo per annum. The terminals also feature extensive Cool Chain facilities including a fleet of Cool Dollys which protect cargo

such as pharmaceuticals and perishables from temperature excursions when on the ramp or when being transported between the aircraft and cargo terminal.

Our investment in our pharma transportation capabilities is another good example. In 2016, we inaugurated our purpose-built facility at Dubai International Airport dedicated to the transport of pharmaceuticals. In addition to this facility, we also have dedicated space at our freighter cargo terminal at Dubai World Central airport. Emirates SkyCargo has over 8,000 square meters of dedicated pharma handling space across its two cargo terminals in Dubai. Our pharma operations at our hub, including both our terminals and our linking trucking operations, have been certified as compliant to EU GDP standards. We operate the world's largest GDP certified multi-airport hub.

 **Aviation Turkey:** Thank you very much for this interview... 



Emirates on Board Lounge



Boeing 777 300ER First Class

Global Supplier Process Streamlined

by Bircem Özekici - COO and Co-founder of DAMISE

Whether we come across new technology via breaking news or if it is something that suddenly creates an unexpected competitive environment, the intensity of the change in results is limitless as technology expands. What is essential in order to manage an environment with an ever-increasing rate of change, volume and scope is anchored in how we react, and whether we look at these events with cautiousness or with an optimistic and opportunistic perspective. Now is the time to explore, don't play the waiting game for the right moment as challenges never cease. Take control today by calibrating yourself and your business to align with the dynamic pace of technology.

Among the most common industries the aviation industry is one of the industries most effected by the results of innovations in technology. According to KMPG's CEO Outlook (2016), the extent of the impact will be tremendous, and 41 percent of CEOs estimate that companies will undergo serious transformations within 3 years. In the previous year's survey, 29 percent of CEOs thought so. In addition, 82 percent of survey respondents are concerned about whether

their company's products or services will meet the needs of customers in the next 3 years, and they have good reason to be concerned. In 2019, 92 percent of CEOs in Turkey (who were in the 44 percent range in 2018) lead drastic digital changes in the company rather than wait for the winds of change to hit. Most of the changes occurred in operational lines. The key challenges the aviation industry needs to consider include- **strengthening the supply chain, effective program management, and use of new and advanced technologies** to become more efficient. The figures below explain the key drivers of 2017 global aerospace and defense industry revenue and 15% of this revenue comes from tier segments. (source: Deloitte 2018 Global Aerospace and Defense Industry Financial Performance Study)

In a more sustainable economy, supply chain

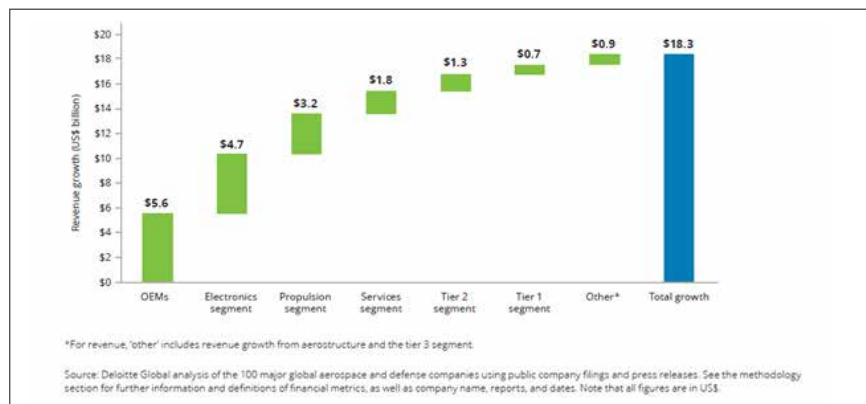
development is more essential than it was in the past. We can observe that each OEM establishes its own supply chain portal and asks their potential suppliers to follow up from their site. For confidentiality, this is crucial, however, from the supplier perspective it becomes a burden because the number of OEMs in the industry is high and the suppliers have to enter almost the same data to each OEM again and again.

Moreover from the procurement side of the OEMs, the tasks of the procurement department are to find vendor companies and collect information about their capacities, sales and credit terms, distribution types and market prestige, buy the best possible product at the lowest cost, ensuring timely delivery of the goods received by the factory, to warn all relevant departments in case of delays in

delivery, to carry out the necessary procedures for the acceptance of the delivered goods and to assist in quality control of acceptance inspections and so on. This chain requires a lot of automated work and it is also time consuming.

Therefore, OEMs prefer to work with flexible suppliers who can provide services at an affordable cost and at the desired quality level, against demand changes. To find companies with the desired standards and criteria is also a complicated process. Most of the time this situation leads to the importation of the products produced locally in our country as they are not known and cannot be found.

On the other hand, it is understood that the most important problems for SMEs are the lack of qualified personnel, procurement of raw materials and semi-products, technology,



product design and development, standards not being understood and quality problems. In addition, because they have difficulty in introducing and branding their talents and products, they cannot get a share from strategic international markets.

In addition, the global supplier processes of international firms are very burdensome and challenging, making the implementation processes of Turkish firms difficult. In order to include Turkish companies in these processes and to increase domestic and national production, knowledge, information and technology should be transferred to the lower-level supplier candidates by using healthy and correct resources. At the same time, this will lead to the formation of a qualified employee culture.

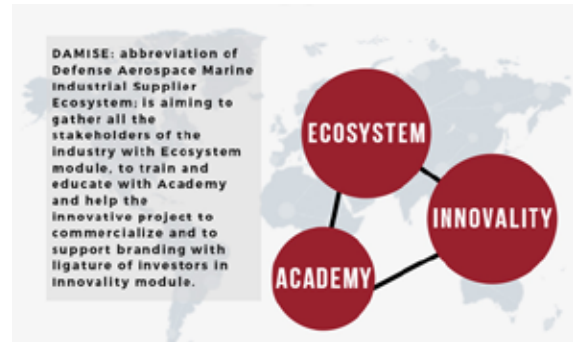
When new product designs and R & D processes are taken into consideration, the fact that developers in this industry are not aware of the existence of another product, the fact that the same product is made by different companies at different times in different places results in a wasting of our national resources and time. As potential investors cannot access the product inventory, the situation of critical and strategic products for our country is not being commercialized.

DAMISE was established to resolve these problems and to become a pre-

strainer so to speak, a viable marketplace. The company name DAMISE is the abbreviation of the Defense Aerospace Marine Industrial Supplier Ecosystem. Our aim is to gather all the stakeholders of the industry within an Ecosystem module, to provide training and education through the DAMISE Academy, to help innovative projects to commercialize and to support branding by connecting investors via our 'Innovality' module.

DAMISE Ecosystem

The DAMISE Ecosystem provides all stakeholders in the defense, aviation, Naval, satellite and space sectors the opportunity to switch to a digital ecosystem with a single click. In the system, sectoral codes, certification information, technical specifications, visuals, and tested capabilities of products will be introduced and readily displayed for potential buyers with an essential ease of access. At the same time, national and international sectoral announcements and tenders will be shared quickly and effectively from a single point to help sector players gain market share. In addition, third-party organizations such as financial institutions, testing and certification centers, laboratories, law firms or insurance companies are also involved in this system. The DAMISE ECOSYSTEM will create a network where everyone



can browse the market in the sector without any boundaries.

DAMISE Academy

The DAMISE Academy will offer our companies the opportunity to reach industrial training from a single point. With DAMISE, participation in international markets will occur by means of an Industry Glossary and Terminology, defined Processes of Being a Supplier of Global Firms and needs analysis of firms. By connecting engineers, company owners and sector players to the best trainers and institutions around the world, DAMISE helps people to reach their goals and get the right information through the right channel. Thanks to the categorization methodology, DAMISE offers training proposals that may be needed for companies within the framework of the training you receive. Companies provide in-house training of their employees through training packages. It will provide one-stop access to industrial analyses, reports and data required by stakeholders.

DAMISE Innovality

DAMISE Innovality will provide our companies and project developers with a platform for the promotion and commercialization of R & D Projects in the defense, aerospace, satellite and space and shipping industries. It will also allow technology transfers between countries, institutions and individuals to meet. In this way, while the dependency on the foreign is reduced, it will be ensured that the sector gains advanced value-added technologies. Thanks to the classification methodology, the investor and the project developer will meet at a common point. Not only individual project developers but also corporate firms can add R & D projects to the system. In the DAMISE Innovality platform, projects are brought together with reliable and visionary investors, aiming for rapid commercialization and growth of companies.

To be part of this new opportunity please contact us from bircem.ozekici@damise.com.

Çelebi Platinum Services

Çelebi is one of the most important global brands of Turkish Civil Aviation and becomes one of the leading ground handling company in Europe as a result of the long-term tradition, knowledge, the importance given to technological and human resources investments and the ability to be fast and flexible. Çelebi stepped into the aviation industry with the establishment of Çelebi Ground Handling at 1st of February 1958 as Turkey's first privately-owned ground handling services company, and now provides ground handling, cargo and warehouse services with more than 14,000 employees, in 2 continents, 4 countries and 40 different airports, and operates 4 lounges at Budapest airport.

In addition to the ground handling, cargo and warehouse services, Çelebi offers Platinum meet and greet services for commercial flights passengers and general aviation services in Turkey and Budapest. Çelebi Platinum welcomes its guests with its experienced team; offers great conveniences to its guests at certain points of all international airports, in their fast track, check



in and passport control processes. Whether they are travelling for leisure or on business, by themselves or as a family, Çelebi Platinum team is ready to identify and meet every need of its guests. Platinum meet and greet services, indiscriminately the domestic or international routes, economy class or business class, are provided to all passengers in each terminal.

Çelebi Platinum Services give services to more than 700 clients now; provide corporate clients, tourism and transfer agencies,

hotels, embassies, hospitals etc., as well as individual clients with meet and greet services for their clients at the airports. The underlying principles of success and the strength of Çelebi Platinum are service excellence, flexibility and customer centricity. Çelebi Platinum team is ready to welcome its guests 24/7 at the airports, meet every need of them throughout the whole journey (from hotel reservation to helicopter rental, from airport transfer to restaurant reservation) and organise

last minute reservations. Çelebi Platinum's clients know that they always be served with a quality of service provided by an experienced team at any time of the day.

Emel Gencer, the Manager of PAS (Personal Assistance Services) stated that "Çelebi is a kind of "Lifesaver" for us and for our guests till years. We are thankful for their kindly experienced way to welcome and support us at any time we need them. A flight without Çelebi Platinum services is unimaginable."

wishes



Prof. Dr. Ferhan Kuyucak Şengür

Professor of Aviation Management and Strategy,
Eskişehir Technical University

I would like to offer my congratulations to the great team at Aviation Turkey Magazine on their exceptional efforts. I believe that the magazine will be a distinguished information source for both the industry

and academia. It will also create a link between them. The content is valuable since it will also reach international audiences and keep them updated about the Turkish aviation industry.

I hope our fast-growing industry will go further with these kinds of endeavors in the future. To reinforce this enthusiastic initiative, I will always be ready to give my full support.

Keep up the good work!

Lale Selamoğlu Kaplan

IATA External Air Law Lecturer



I am very happy and proud to share our aviation magazine in every part of the world, which fills an important gap in the Turkish aviation sector

with its rich content in English. I am looking forward to each and every issue of our magazine addressing many issues that are of particular

concern to the aviation sector and following the developments both in the world and in the Turkish aviation.



Renan Gökyay

Partner & Chief Designer of Nurus

The civil aviation, defense and aerospace industries have become Turkey's successful development stories in recent years. As Turkey proves its

presence in all branches of aviation, timely and correct flow of information is very important. I believe that Aviation Turkey will definitely add new breath

in the field of civil aviation and address all the needs of aviation enthusiasts. As a member of the advisory board, I wish success to Aviation Turkey.

Z.İrem Hiçyorulmaz

General Manager Fly Service Turkey



Aviation Turkey, with its great team, introduced us a new, belated and that's why very essential product that will be the voice of our industry globally as our

country is a major player in the aviation sector.

As Fly Service Turkey, we will be more than happy to be the part of this publication.

I wish Aviation Turkey magazine team success and all the best on this long running publishing journey.

Bilen Air Services Turkey's Leader in FBO Services & Airline Representation and Supervision



Bilen Air Services was established in 1995 as an aviation supervision and representation in Istanbul, Turkey. In 2007 the company acquired new, professional Management and developed into a global aviation services company which is tailored to their customers' needs. With 20 years of experience and perspective, Bilen ensures executive level service quality at 23 airports in Turkey.

With a business strategy set by management, based on professional and personalized service, Bilen Air Services strives to meet every request. With a hands on approach, the management team provides guidance with their 25 years of experience in the aviation industry. With a passion for aviation, the entire personnel team is inspired by being able to provide the same professional approach to clients at every stage of client service. Proudly, Bilen Air Services is the leading aviation solutions and

representation company in Turkey.

Airline representation

Airline representation is one of Bilen's Professional services, providing executive and cost services for airline needs.

- * Permit and slot arrangements
- * Supervision for check in, load control, ramp
- * Processing of excess baggage charges
- * Passenger meet and greet
- * Getting the best price from various service providers
- * Airport taxes
- * Catering
- * Fueling
- * Ticket sales

Supervision

Bilen offers a smooth operational experience to produce tailored services for passengers, crew and

operators / airlines.

Their highly trained supervisors assist with all expects of service with a smile and Professional attention. They take care of every detail after landing and before departure.

- * Corporate, VIP, airline flight coordination
- * Custom and immigration assistance
- * Passenger and ramp handling coordination

FBO& operations control center

Their OCC personnel are dedicated to making each crew and passenger's Flight unique, elegant and comfortable.

Exceeding guest expectations, in terms of safety, cost effective services while offering executive hospitality is at the core of their business, with an FBO that anticipates client needs.

- * 24/7 personalized services

- * Quick turnaround
- * VIP passenger meet and greet service
- * Effortless customs and immigration
- * VIP passenger lounge
- * Comfortable crew facilities
- * Passenger and crew transportation
- * Luxury or cost-effective hotel reservations

- * VIP flight catering
- * Cooperate fuel
- * Permit and slots
- * Hangarage
- * Aircraft cleaning

Flight planning

Bilen Air Services offers a dedicated team to quickly respond the pilot needs 24/7.

The flight dispatchers follow worldwide regulations and search for solutions to challenges especially for last minute



requests. Bilen has 2 in-house dispatch centers which are based in Istanbul and Ankara.

- * **Worldwide permission - landing, transit and overflight**
- * **Computerized flight planning**
- * **Weather and NOTAM services**
- * **Airport slots**
- * **Flight watch**
- * **Ground handling arrangements**
- * **Airport data and information**
- * **Fuel services**
- * **Catering services**
- * **VIP, CIP lounge arrangements**
- * **Accommodation and transportation**
- * **Route analysis, weight and balance preparation, performance charts**

Cargo

Bilen Air Services offers expert cargo supervision for an on-time delivery tailored to each shipment. They ensure that damage to cargo is avoided and places a priority on securing them safely.

Supervision is provided for unique requests and experienced assistance with;

- * **Airway billing**
- * **Packing**
- * **Stowing**
- * **Securing**
- * **Handling**
- * **Cargo aircraft charter**
- * **Partial air-cargo transportation**
- * **Export shipping**
- * **Import transport**
- * **Project transport**
- * **Land transport**

Tourism agency

Bilen Air Services has an A certified tourism agency Bildays which meet travel needs 24/7. They assist passengers with planning trips involving multiple airlines. They also assist at the ticket counter with a knowledge of flight schedules. Bildays offers the most suitable and cost saving airlines and flight connections for passenger and corporate needs with experienced personnel.

- * **International tours**
- * **Cultural tours**
- * **Hotel reservations**
- * **VIP transportation**
- * **Car rental**
- * **Flight ticketing**
- * **Passport and Visa procedures**
- * **Yacht rental**

Aircraft management

JetGlobe has been providing aircraft management services globally as an air taxi company and a flight services operator since 2008 and is based at Istanbul Ataturk Airport. The company changed its name from Turkmen Air to JetGlobe in 2017. JetGlobe's mission is to provide the best quality of service to VIP customers 24/7. They have added aircraft Management to their list of services in addition to charter services, after they were acquired by Bilen Air Services in December 2015.

They have the capability to serve all customer needs via an internal structure with flight operations, ground services, flight support services, flight chartering and aircraft management all over the world.

JetGlobe invites passengers to 'feel the highest quality & safety flight with JETGLOBE.'



Welcome to the Airline Bankruptcy Race!

by Muhammed Yilmaz

Many years from now, when we take a look back at the history of aviation, we will definitely remember the 2010s as the peak of time of when many airlines filed bankruptcy. Since 2007, 284 airlines have had to stop their flights and the total figure so far for 2019 has reached 24.

Some of airlines that discontinued their flights especially in the last 2 years appeared in the news while a majority of them quietly left the market and took their place in the dusty pages of history. Let's explore the reasons that led many of these airlines to an unfortunate end...

Increasing costs

One of the most important components of airline operations is the correct analysis and management of costs. Very few of airline overhead costs are fixed expenses. Fuel prices are the major cost item for airlines and the worst thing is that fuel prices are constantly changing due to incidents that occur around the world. Unstable changes in such an important expense line item make the budget unmanageable.

Statistics show that in 2018, fuel costs

constituted an average of 23.5% of the total cost of airlines. This rate was calculated as 32.3% in 2012 and the estimates for the end of 2019 reveal that 25% of total expenses are expected to be fuel costs.

In many countries, labor costs are as unstable as oil prices. Official figures show that labor costs outpaced fuel costs in 2016 for the first time in aviation history (22% labor - 21% fuel). The IATA's latest financial report also shows that airlines are projected to lose US\$ 5 billion globally due to increasing employment costs.

The European Union's rigid stance on passenger rights compensation also creates additional pressure on airlines. Delays and cancellations now translate to tens of thousands of dollars of compensation for airlines. Furthermore, additional environmental and emission taxes imposed on flights by some countries, such as Germany and France, cause an increase in airline overheads. This results in new deficits that need to be covered in their annual cost sheets. Airlines with relatively less financial strength are incapable of taking

action in the midst of these unexpected changes as well as regulatory changes and consequently they are unable to survive.

Demand and supply imbalance

Supply and demand imbalance problems have occurred in many aviation markets, primarily in Europe. There is a significant imbalance between the size of the market and the number of airlines needed and the number of airlines available. In other words, there are more airlines in the market than required. All airlines are seriously struggling to maintain their market share. For example, according to CAPA data, in 2018, the seven largest airlines in Europe constituted 55% of the market, compared to 82% in North America. According to the IATA, flight traffic in Europe has increased by more than 40% in the last decade. Simultaneously, prices have fallen and have started to exert negative pressure on the profit margins of airlines. As a result, this outlook has disrupted current financial statements.

Europe, however, is not the only market where airlines encounter fierce competition. Jet Airways

could not resist the rise of low-cost airlines in India. South African Airways, one of the oldest airlines in Africa, just barely survives because of state aid (citizens' taxes) as they face competition from foreign airlines that are pouring into their country.

Uncontrolled growth

In general, the growth in flight networks and growth in the fleet and services of airlines has a positive indication, provided that such growth is achieved within a controlled manner. When companies attempt to perform many activities simultaneously and in a short period of time as per their growth strategies, they lose control of their financial balance and enter serious turbulence. At that moment a free fall can occur and the airline begins to sail to the point of no return. The best example is Primera Air.

Primera, a low-cost airline, stormed into the market and was taking firms steps forward. Rather quickly they started a significant acceleration in new destinations and new aircraft. They even started providing low-priced transatlantic

flights. However, during this process, expenses and costs were increasing and the anticipated income level could not be achieved in return. Eventually, the managers threw in the towel and discontinued flight operations, which had recently become complicated, and flights were completely stopped.

Iceland's WOW Air also started to serve passengers at very low prices for transatlantic destinations. The pricing system, which many passengers called "too cheap to be true", was the beginning of the end for the airline.

Strikes and compensations

The last few years have also been very difficult for airlines due to labor unrest. Increased fuel and labor costs, as well as strikes and action by various European airline personnel, airports and towers, posed critical problems for many airlines.

In 2017, there was a 300% increase in strikes in France and 39,000 flights were cancelled/delayed just in the month of May alone. The situation was similar in Germany, England and many other countries. Any flight that was delayed or canceled

Airlines that stopped flying in 2018
Primera Air (Denmark)
Saratov Airlines (Russia)
Small Planet Airlines (Lithuania)
Privat Air (Switzerland)
Skywork Airlines (Switzerland)
Cobalt
VLM Airlines
FlyViking (Norway)
Dart Airlines (Ukraine)
Nextjet (Sweden)
OneJet (USA)
Wataniya Airways (Kuwait)
PAWA Dominicana (Dominican Republic)
LC Perú
Bassaka Air (Cambodia)
Air Bagan (Burma)
Zoom Air (India)
Orient Thai Airlines (Thailand)
Airlines that stopped flying in 2019
Germania (Germany)
California Pacific (USA)
Flybmi (UK)
Insel Air (Curacao)
Tajik Air (Tajikistan)
Asian Express Airline (Tajikistan)
WOW Air (Iceland)
Aerolíneas de Antioquia (Colombia)
Fly Jamaica Airways (Jamaica)
Air Philip (South Korea)
Jet Airways (India)
Wisdom Airways (Thailand)
Avianca Brazil
Avianca Argentina
Al Naser Wings Airlines (Iraq)
Aigle Azur (France)
XL Airways (France)
Thomas Cook (UK)
Adria (Slovenia)
Peruvian Airlines (Peru)
New Gen Airways (Thailand)
Via Airlines (US)
TAM Bolivia
Shaheen Airlines (Pakistan)

ARTICLE

as a result of a strike caused serious damage to airlines and during this process airlines were required to arrange hotel accommodations for impacted passengers, meet their needs and pay them large amounts of compensation. Above all, the cost of losing customer trust is detrimental to say the least. With the irreparable damage of negative customer stories shared among family, friends, social media, it is no surprise that reputations were quickly destroyed.

Even if larger airlines were able to maintain high profit margins and a financially sound bottom line, weathering the storm so to speak and able to more easily tolerate the impact of such an occurrence, it was very painful for smaller airlines to overcome this situation.

What will happen next?

Thanks to the European Union and its airline liberalization program, larger airlines such as

LAG, Lufthansa and Air France-KLM are trying to find ways to compete in the market with low-cost carriers such as



Ryanair and EasyJet. Since the beginning of the new millennium, Europe's largest airlines have been gradually transforming into larger airline groups with multiple reputable brands. The consolidation such as Ryanair's takeover of Laudamotion and Malta Air is one of the potential results that we will witness more of in the future, especially in the European aviation market. The number of such cases must increase as time goes by, because the supply surplus in the market is not sustainable.

Bankruptcy decisions often arise when the airline needs an investor

and such an investor cannot be obtained. We see similar processes experienced both with WOW Air and Cobalt. Even if the negotiations with investors seemed likely to break the deadlock, the airlines were forced to close their doors when the negotiations ended.

The volatility of oil prices still continue. Regardless of the short-term fluctuations, the general view in the sector is that prices will continue to rise for the next five years. With the expectation of an increase in the potential number of strikes of airlines flight personnel, air control tower personnel and

airport ground handling personnel, as well as the Brexit process that concerns Europe overall, the positions of the airlines in the market are expected to change significantly.

The strength of the US Dollar is an important factor as well that increasing the costs, the downward trend of the European economy, decline in GDP growth rates in Germany and the UK and the recession in Italy are serious concerns for the future of the airlines. European airlines are on full alert before the upcoming winter season. Together as a global audience, we'll see what will come to pass 🌐

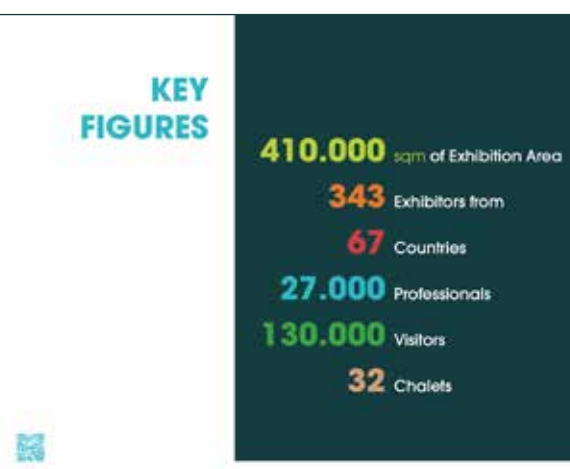
Eurasia Airshow 2020 will Bring together Decision Makers of the Global Aerospace Industry

Eurasia Airshow 2020 will take place between the 22nd and 26th of April 2020. It is important to underline that the Eurasia Airshow has fully targeted the Eurasian market in terms of participants and achieved success in this regard. Leading companies worldwide such as Boeing, Sukhoi, UAC, Antonov, BAE Systems, Rostec, Embraer, Qatar Airways, Thales, Honeywell, GE Aviation, Pratt Whitney, Dassault Systems, Goodrich, IRKUT participated in Eurasia Airshow 2018. Turkish Local Industry has successfully been represented by Turkish Airlines, Turkish Aerospace, Aselsan, Havelsan, Alp Havaşılık etc. with the contribution of around 343 companies. Eurasia Airshow 2018 was honored with the participation of 168 military & civil official delegations from 73 countries. The Eurasia Airshow had 81 Aircraft on static display and had

more than 100 flight demonstrations and 15+ Billion USD of business on board.

Eurasia Airshow 2020 will be in Antalya which is Turkey's most popular tourism destination, and one that hosts very important events, such as the G-20. At the Antalya International Airport – which, with its enormous size and tremendous infrastructure, is one of Turkey's three busiest airports – Eurasia Airshow 2020 will have a static display area for 100+ aircraft with a total area of 300,000 square meters. The aim of the Eurasia Airshow is to host 150 military and civil delegations, 100,000 professional visitors and more than 400 distinguished companies plus many airlines and aircraft maintenance companies.

Eurasia Airshow 2020 will serve as a business development platform, where the aviation products of our country, as well its partnerships and business models



in this field, will be introduced. Furthermore, all parties concerned will come together to talk about business, learn about each other's capabilities, and establish business contacts. The Eurasia Airshow will also be a platform that will be attended by the industry's

decision makers, the producers of commercial and military aircraft, subcomponents and systems.

It will be an honor to welcome guests and exhibitors to promote the growth of their businesses. We Rise Together 🌍





© SIAE Salon du Bourget

What Happened at the Paris Air Show?

The Paris Air Show, one of the most important aviation organizations in the world, opened its doors to visitors for the 53rd time between 17-23 June 2019. The fair was particularly important for us as a publication team this year because Aviation Turkey Magazine was officially launched at the Paris Air Show.

As common every year, inquiries were made as to how many orders the manufacturers would receive. This year's Paris Air Show was one of the quietest in recent years for commercial aircraft

order commitments for big two manufacturers Airbus and Boeing. 866 aircraft covered by these commitments, orders, letters of intent, options or the revealing of previously undisclosed customers. The list price for new orders amounted to nearly 60.9 billion dollars.

Narrow body aircraft accounted for almost 67 percent of the order commitments announced during the show. Much of that was driven by the launch of the A321XLR from Airbus and the size of the IAG deal for the Max aircraft. There were

relatively few widebody deals. These covered 62 aircraft which equates to around 7% of total aircraft.

Airbus marked its 50th anniversary by disclosing more business than its rival Boeing. Airbus launched its new extra-long-range model the A321XLR and secured orders and commitments, including conversions, for over 240 aircraft. Airbus logged 388 fresh commitments at the end of the show and 344 order conversions to give it the largest share of business during the show. European

manufacturers also secured 85 commitments for the A220 which was the former CSeries aircraft.

While it was generally a quiet show for Boeing, it did secure a huge confidence boost for its grounded 737 MAX when International Airlines Group (IAG) struck a preliminary deal for 200 of the 737 MAX type aircraft.

On the regional side it was a big show for ATR for securing a commitment for over 100 aircraft from lessor NAC. On the other hand, ATR meanwhile closed in on launching a



short take-off and landing version of the ATR 42-600 with some initial commitments. Embraer too booked business for 78 aircraft at the show, including a major deal for E195-E2s from Dutch carrier KLM.

Japan's Mitsubishi Aircraft Corp. displayed its SpaceJet at the 2019 International Paris Air Show, marking the first public exhibit of the plane since it was renamed from the Mitsubishi Regional Jet. The name changes for the first Japanese developed small passenger jet came amid prolonged development and subsequent repeated delays in its deliveries. Mitsubishi Aircraft hopes to put the M100, a 70-seater model from the SpaceJet family, on the market in 2023. It's surprising initial commitment for 15 M100s during the show was the first deal. The company aims to make the first delivery of the 90-seater M90 SpaceJet model in mid-2020.

What is the A321XLR?

Airlines are increasingly more inclined to operate smaller, more fuel-efficient planes on longer, more niche routes (like India to Europe or China to Australia). The trend towards more fuel-efficient single aisle aircraft comes at a time when "jumbo jets" are retiring from the skies.

A321XLR is a new member of A320neo family which have especially impressive fuel efficiency. Airbus says the aircraft will have a 15 percent longer range than the current A321LR (Long Range). The aircraft is based on the reconfigured fuselage of the A321neo. A321neos are powered by CFM International Leap-1A or Pratt & Whitney PW1100G engines.

The new extra long-range aircraft will be capable of flying distances up to 4,700 nautical miles "bringing 30 percent lower fuel burn per seat than previous generation competitor aircraft," according to the manufacturer. The extra-long range means that U.S. airlines will be able to operate flights to much of South America and Europe with the planes.

The plane will have a capacity of anywhere from 200 to 244 passengers, depending on the airline's chosen seat configuration. The A321XLR is expected to take to the skies in 2023.

Potential customers could include JetBlue, American Airlines and Indigo Partners. The planes are

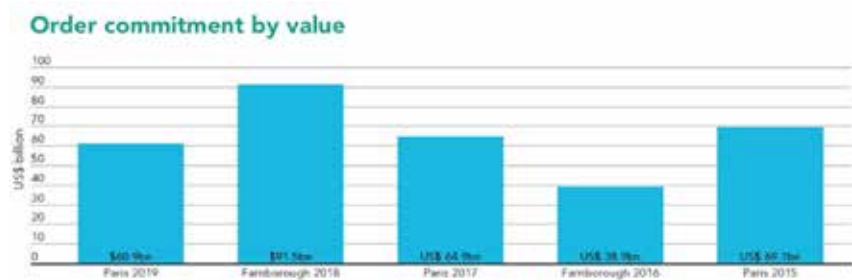
also used to increase transatlantic travel, particularly on lower cost airlines.

Big surprise: 737 MAX orders

The big surprise at the Paris Air Show was the agreement between Boeing and International Airlines Group (IAG) for 200 aircraft from the 737 MAX family.

IAG is the parent company of Aer Lingus, British Airways, Iberia, Vueling and LEVEL that fly more than 113 million passengers a year combined.

The agreement which has a total value of \$24 billion contains a combination of the 737 MAX 8, which seats up to 178 passengers in a two-class configuration,





Airbus A350-1000

and the larger 737 MAX 10 jet, which can accommodate as many as 230 passengers. IAG anticipates deploying the aircraft at a number of the group's airlines including Vueling and LEVEL.

"We're very pleased to sign this letter of

intent with Boeing and are certain that these aircraft will be a great addition to IAG's short-haul fleet. We have every confidence in Boeing and expect that the aircraft will make a successful return to service in the coming months having



© Aviation Turkey

Aviation Turkey Team were at Paris Air Show' 19

were counted in the final results which assessed over 300 airlines in 2019.

Qatar Airways has been named the 2019 'World's Best Airlines' by Skytrax.

This isn't the first time Qatar Airways has received the top spot on the Skytrax list. The airline won the award in 2011, 2012, 2015 and 2017. Qatar Airways is the first airline to have won the top spot five times.

EVENT TYPE	QUANTITY	SHARE
Narrowbody	558	64%
Widebody	62	7%
Regional jet	93	11%
Turboprop	153	18%
TOTAL	866	100%

received approval from the regulators" said Willie Walsh, IAG chief executive.

Qatar Airways also won the World's Best Business Class, the World's Best Business Class Seat and the Best Airline in the Middle East for 2019

Who is the best airline in the world?

This year's Skytrax awards event was held at the air and space museum at Le Bourget as part of the Paris Air Show. The long awaited Skytrax awards were unveiled and Qatar Airways came out shining in multiple fields.

The awards are selected from passenger and guest feedback, through surveys. 21.65 million eligible survey entries

The World's Top 10 Airlines for 2019	
1.	Qatar Airways
2.	Singapore Airlines
3.	ANA All Nippon Airways
4.	Cathay Pacific
5.	Emirates
6.	EVA Air
7.	Hainan Airlines
8.	Qantas Airways
9.	Lufthansa
10.	Thai Airways



ILA BERLIN

INNOVATION AND
LEADERSHIP IN
AEROSPACE

May 13 – 17, 2020

Berlin ExpoCenter Airport
www.ila-berlin.com

BDLI  German Aerospace Industries
Association

 **Messe Berlin**

Hosted by  **LAND
BRANDENBURG**



Oshkosh Air Venture '19 – Gathering Point of Aviation Enthusiasts

by Serdar Çora & Fikri Akçalı

Oshkosh AirVenture is regarded as one of the largest aviation organizations in the world and recently celebrating its 50th anniversary this year. This organization can certainly be considered as the nirvana of fairs for professional & amateur aviators who wish to experience the magnificent atmosphere.

As aviation enthusiasts, we have been making plans to realize this dream for a long time, Oshkosh AirVenture was at the top of our bucket list and it was due time and the right time to go. We prepared our itinerary and arrangements accordingly and set off to take part in this giant organization that

was scheduled to last 6 days and was sure to be memorable for a lifetime.

On July 20, 2019, we started our journey from Istanbul and landed at our first destination, Chicago. Following an overnight stay in Chicago, we set off on July 21, 2019 to the city of Oshkosh, which

is about 280 km from Chicago.

Since it was not easy to arrange accommodations in Oshkosh during the dates of the AirVenture event, we checked into a hotel in Green Bay that was about 40 minutes from Oshkosh and then we immediately went

to preview the event at Oshkosh Wittman Airport, the site of this year's Oshkosh EAA AirVenture. After registration we were filled with pride as the first aviation enthusiasts from Turkey, we had our place pinned on the world map. Then we took a short walk in the main





open area and watched the landing of the planes that were arriving for the show.

On July 22 at 09:00 a.m., even though we set off early for the events, there was a heavy traffic on the way to Oshkosh as soon as we exited from the highway. A small suggestion to those attending this event in the future would be to add an additional 1 hour to the transportation period for a 40-minute distance. Despite all, when you arrive at the event venue, you will figure out that it is well worth the effort to get there. This is exactly how we felt after our long journey from Turkey and after spending an additional hour on the highway.

The organization was held on all the runways

of Wittman Airport. Apart from 4 separate Exhibit Hangars where all small and large manufacturers' stands were located, a festival area was composed of Main Aircraft Display, Homebuilt Aircraft Display, Fly Market, Ultralight / Rotor Display, EAA Education / Career Center, EAA Innovation Showcase, International Pavilion, Seaplane Base, Aviation Gateway Park, EAA UAM Showcase, Warbird Alley, Homebuilders Hangar, Airplane Workshops, Forums, Vintage Hangar, RC Flying Area, Fly-In Theater, where nearly all types of air platforms were displayed and that were quite appealing to aviation enthusiasts.

Thanks to the voluntary and utmost efforts of the locals of the city of Oshkosh, I can say that we

had a splendid experience throughout our trip. The participation of 5,500 volunteers from all ages, from ticket sales to traffic rules, shuttle services and guidance effectively helped this organization's flawless performance. In advance of the festival kick-off, it was clear in our minds that the devotion of the Oshkosh residents would successfully carry this 50-year legacy into the future.



One of the most fascinating points of the event was that airplane owners from America as well as all over the world came to Oshkosh with their own planes and set up camp for a week under their plane's shadow. It was worth seeing the colorful images created by these aviators with a common passion for aviation. The 2019 Oshkosh AirVenture event hosted about 40,000 visitors, more than 12,300 airplanes and caravans throughout the six-days of attractions. Thanks to the sweeping campgrounds for those who willing to travel with caravans, in addition to those landing at the event by airplane. The large number of airplanes also meant that air traffic controllers of Wittman Airport shouldered a great deal of responsibility. A total of 16,807 flight operations took place during the 11-

day period from July 19 to 29, with an average of 127 landings/take-offs per hour from Wittman Airport, making this tower the world's busiest Flight Control Tower.

The number of airplanes simultaneously in the air was stunning. The successive landings and takeoffs were unmistakably categorized as airspace model airplanes, helicopters, home-built aircraft, General Aviation and Airshow.

The static and dynamic demonstration of the U.S. Air Force and Airlines' aircraft, landing and take-off of various aircraft at the venue each day reminded us once again how valuable state support is in these types of aviation events.

Particularly, the performance of modern airplanes in formation flights with classic airplanes was also important to demonstrate respect for the past and to highlight the point which aviation has now reached. The P-51, F-22, A-10 and F-35's formation flights and then their solo demonstrations were worth seeing. The F-35A show was of course the most attentive of flight demonstration for us, as Turkish citizens. However, the performance of the F-22 Raptor was frankly more impressive.



While the successful aerobatic demonstration flights were watched with enthusiasm by those in the audiences of all ages, acrobatic groups from all over the world were brought together and exciting flights of amateur-designed experimental airplanes were impressive.

The very rare and uncommon Night Air Show, a special element to celebrate the 50th year of the organization, allowed us to watch aerobatic

flights with spectacular visual effects. Even if situational awareness was very limited in night aerobatic flights, there were excellent coordinated aerobatics. The fireworks show at the end was huge in size and something that we had never seen before and it was extremely remarkable.

The airplanes of the 1940s, which were in pristine condition and looked as if they were brand new, reminded us of the phrase "There are no old planes, there

are neglected planes" and their flights were well worth seeing. There was a separate area for warplanes, and we witnessed that the age of the planes and their civilian owners are nearly same and that the owners cared for these warplanes as their babies; this was a clear indication that an entire life was devoted to these planes, an integral part of the owner's life story.

The participation of universities and NASA in the event was satisfying for visitors interested in





the academic aspects of aviation. At the event venue, there were many stands of aviation departments of numerous universities. In this area, there were various activities for children and young people that sparked interested and imagination. It was really probable for a young person who visited the NASA tent to dream of becoming an astronaut and going to space, even if he had no interest in space and aviation. Free books and posters were distributed at the NASA tent, there were opportunities to chat with experts who explained NASA's latest projects in simple terms, basic simulators, and activities geared toward the introduction of new technologies made this tent one of AirVenture's most popular attractions.

Of course, this event should not be regarded

as an organization where only air shows are held. In addition to demonstration flights, many workshops were held on various subjects such as metal, wood, composite etc. and visitors had the opportunity to participate in these workshops as amateurs. On the other hand, it was also possible to find companies here that targeted amateur aviators. Such as companies that are developing and

marketing products for people who own their own aircraft.

Major OEMs such as Boeing and Airbus also attended the event for professionals. While Airbus exhibited its newly developed electrically powered aircraft, Boeing had a large tent to showcase its military and civilian products.

The Seaplane Base, which seaplane owners utilized to park their planes, opened its

doors to visitors during AirVenture. Even though the planes in this area did not perform demonstration flights, it was a pleasure to watch all the landings and taking offs over a lake in the green area, which was handled with safety and care for themselves and the safety of other planes.

During the event, small tours were organized via the flights of Bell 47, Ford Tri-Motor and B-17 Aluminum Overcast



aircraft to view Oshkosh from the air. Old aircraft enthusiasts were given the opportunity to fly with these aircraft. The interest in these flights continued throughout the event and the planes were constantly in the air until the very last day of the event. Around 7,000 enthusiasts enjoyed these flights and had the opportunity to watch the 50th Oshkosh event with a bird's eye view.

At the demonstrations of the old bomber aircraft, theatrical scenes were enacted for the audience. Thanks to the very professionally made special effects at the target points, the explosion sequence performed by such aircraft seemed very real, even if they did not drop real bombs. At some moments we felt like we were in a war movie scene. As the visual show was also equipped with blast effects, the rumble and vibration was felt by the audience.

The venue where this event takes place is open to the EAA and other aviation organizations during the year. The hangar and Vintage Club, located outside the square and used by vintage aircraft owners to renew their aircraft, were used by RC Model aircraft pilots during the event.



EAA Museum

The EAA Museum located at the entrance was one of the most exceptional museums we have ever seen. It was exciting to see the replica of the Spirit of St. Louis airplane which Charles Lindberg made the legendary flight to the Atlantic, and the replica of the Voyager airplane which performed a non-stop flight around the world with a single-tank of fuel, known as "The Last First".

We had the opportunity to meet with the legendary pilot Dick Rutan, who was invited as a speaker to the museum and one of the great contributors of Voyage's success and we had a chance to chat about the period during his assignment in Turkey.

The museum attracted

considerable attention because of the simulations, interactive games and experimental setups related to the various airplanes. Even in this part of the museum, you could spend many hours and sow the seeds of aviation among future aviators. I hope to see this section particularly designed for children in our country in the upcoming years.

Oshkosh AirVenture is known as the most intense moment of aviation even though it continues throughout the year. We believe that events like Airex, Teknofest, Eurasia, Municipal Festivals and Sivrihisar Air Show, which have been increasingly held in our country in recent years, are meant to be the points where aviation love starts especially

for children and young people, apart from being the gathering points of aviation enthusiasts and flight demonstrations. Aviation love of children and youngsters will initially carry them forward and then their country. However, it is very important that these events should not remain only as Air Shows; they should be held especially in the field of amateur aviation throughout the year at different points, more clubs and associations should be established, and aviation should become part of recreation, a hobby of for the public to enjoy. We hope that in the coming years, we will continue to see such events more frequently in our country with increasing quality and large numbers of eager participants 🇹🇷



3rd TRAVEL LAW FORUM

Friday, March 27th 2020
Novotel Istanbul Bosphorus

For more information please contact:
Konstantina Sylleou – conferences@palladian.gr
+30 210 33 92 321

In Cooperation



Media Partner



TEKNOFEST '19



BE-200ES



by Cem DOĞUT

TEKNOFEST 2019 – From the Spotter's Vantage Point

Teknofest Aviation, Space and Technology Festival was held between September 17-22 at the Atatürk Airport under the leadership of the Technology Team Foundation (T3 Foundation) and the Ministry of Industry and Technology and with the support of public and private institutions. Within the scope of the festival, 19 technology competitions in 44 categories were realized and 17 thousand 373 teams and 50 thousand competitors attended. 10 thousand competitors competed in the final. People from Turkey's 81 provinces and from 122

countries participated in the competitions. In the festival area, many local companies also introduced their products and capabilities to visitors at the stands allocated to them. Turkey's most well-attended festival, namely Teknofest 2019, broke a record this year and hosted a total of 1.72 million aviation enthusiasts, old/young, male/female, amateur/professional, needless to say, a wide variety of visitors participated in this incredible event that spanned a period of 6 engaging days.

Another prominent feature of the festival was the fact that it was the biggest air show in our country. Nearly 480 spotters applied to watch the shows. 60 of them were selected as permanent spotters and 60 as alternates. For the spotters, two towers were prepared in the show area, overlooking the runway and the taxiway. As in the previous year, the Turkish Armed Forces took part in the festival this year with broad participation. The Air Force participated in the festival with the Turkish Stars and Solo Türk demonstration teams as

well as with AS532, CN-235M, C-130B, C-160D, A-400M, KT-1T, T-38M, F-4E / 2020 and F-16C, Land Forces with CH-47F, S-70D and T-129B, and Naval Forces with P-235, ATR-72 and S-70B. The institutions of the Ministry of Interior also attended the shows. The Gendarmerie Command attended with the Çelik Kanatlar (Steel Wings) demonstration team with two S-70As and S-70, Coast Guard Command with AB-412EP and CN-235M, Police Aviation with S-70A and Bell 429. The Bayraktar Akıncı Armed Unmanned Aerial Vehicle





Turkish Stars



MC-21 300

TEKNOFEST '19

(SiHA) was exhibited for the first time in the static area, the Turkish Aerospace's Project National Combat Aircraft (MMU) and Hürkuş drew great attention from the participants. Together with other participants, 40 aircraft were exhibited in the static area, while 23 different types of aircraft performed in various air shows.

The biggest surprise for the aviation photographers of Teknofest 2019 was the participation of Russian companies and the Russian Air Forces aerobatic demonstration team, the Russian Knights. Founded on April 5, 1991 at the Kubinka Air Base, Russian Knights is a team that performs mostly in Russia and does not travel abroad. Therefore, its participation for an air show in Turkey is very important. The team performed two shows at Teknofest with four Su-30SMs. The United Aircraft Corporation (UAC) representing Russia at Teknofest was the biggest company in Russia. The participation of the company with MC-21-300, Superjet 100, Be-200ES and the star of the demonstrations, the Su-35S, was a significant

indicator of the recent re-establishment of relations between Russia and Turkey. Thanks to its AL-41F engines having two thrust vector control (TVC) nozzles, the Su-35S, flying by Sukhoi chief test pilot Yury Vashchuk, fascinated aviation enthusiasts with its short take-off ability and maneuvers challenging the laws of physics. The MC-21-300 - Irkut production, a company of UAC - impressed the audience with its maneuvers which were as good as the combat aircraft. The firefighting aircraft, that were on the agenda at the end of the summer due to forest fires, also participated in Teknofest. Beriev Be-200ES and Canadair CL-215 performed demonstration flights.

The air shows of the Turkish Stars and Solo Türk received a great deal of interest and attention from the audience, as usual. Solo Türk made a flight every day during the show and in a way hosted Teknofest. Personnel Search and Rescue exercises jointly carried out by the Ministry of Interior elements and the elements of Land Aviation were also unforgettable moments created for aviation photographers.

The surprise among these exercises was the F-16C, providing close air support to helicopters as per the scenario. For this role, the pilot of Solo Türk's air show was Major Emre Mert. During his first-time performance ever, Mert received full marks from the audience. During the exercise scenario, low-altitude flares were fired to simulate the bombs released from the F-16. One of these flares caused the grass near the runway to flame up and the Airport Fire Department responded to the fire.

The show of Gendarmerie Aviation's Çelik Kanatlar (Steel Wings) team with Land Aviation's two ATAK helicopters, together and simultaneous, was truly breathtaking. Gendarmerie and Police helicopters and air vehicles of civilian flight academies conducted inspirational flights for

the students. With these flights, 2,013 students had the opportunity to become acquainted with the sky for the first time. Within the scope of the air shows, a total of 825 landings and take-offs were performed including student flights; thus, a very entertaining event was realized both for the audience and aviation photographers. In the last two years, both Teknofest and the Eurasia Airshow have made a great leap forward in this field. With each passing day, there is increasing interest in air shows and in aviation photography. We, as aviation photographers, are very happy to see such organizations in our country, those that are equivalent to similar air shows in the world. Up next for Turkey is the Eurasia Airshow 2020, which will be held in Antalya on April 22-26, 2020 🌐



Hello to All Aviation Fans!

by Aslihan Aydemir

My insatiable appetite for aviation was well satisfied at the Wings Over Baltics Airshow 20/21 July 2019 which was held at the Latvia / Jurmala Airport. The show fulfilled my senses with many incredible performances and demonstrations that were enhanced with the wonderful noise of these flying babes. I especially enjoyed the bomb effect of the F16, it was quite amazing and one of the highlights for me.

After the mind-blowing success of the show last year, Wings Over Baltics Airshow 2018, the second edition of the Baltics was a much-anticipated aviation event - Wings Over Baltics Airshow 2019! I've commented very openly like this because the event had all the right elements for an air show. Sometimes at these types of shows you feel like you are going to the cinema and see an overload of advertisements and of course you lose your excitement, but this is the main point that makes this event stand out among the other airshows that I've experienced before. This is not an exhibition it is truly a 100% knock-your-socks-off airshow!

The event hosted more than 20 000 aviation enthusiasts for both show days. That was also fantastic as most of these people now have made great memories and the kids may be the most important detail here, these kids who have experienced the spark of excitement will be the future pioneers of aviation. They have new dreams and ideas ignited by the sights and sounds of the airshow, imagining many new possibilities and reaching for new targets in their lives.

Let's see the show:

More international and local display teams and jaw dropping solo performances from the best in the business:

Baltic Bees Jet Team L39C x7, F-16 Falcon, JAS 39 Gripen, Team Orlik x4, Jurgis Kairys Solo, BMW M5 vs. L39C race, HU-60S BlackHawk, DC-3 DAKOTA - x2, R-44, Team Aeroprakt x2 and AN-2 etc.

Touch the aircraft

Closer than ever. As close as it gets.

Wings Over Baltics



Aslihan Aydemir

Airshow 2019 invites you for a up close, face to face meet with the most amazing aircraft.

Everything in a reach of a hand or a sight (up in the air).

It will be even possible to get into the cockpit of some aircrafts

Meet the pilots

Autographs, handshakes, selfies!

Your chance to meet the best of the best!

Wings Over Baltics Airshow 2019 gives you the opportunity to meet the Gods of the Sky in person!

Meet and greet sessions will be held during the display time.

Perfect place for kids to see who they want to be when they grow up!

Fly the Aircraft

Be a pilot for a day yourself!

Wings Over Baltics

Airshow 2019 is your opportunity to not only see the exciting show in the sky, but also to feel the actual flight on your own skin and the tickle in your stomach!

Several flight options will be available for the public - starting from small planes up to jets!

If you are looking to have a taste of this Adrenaline rush with the Baltic Team still you have a chance to experience;

Aerobatic maneuvers during the flight:

- > Turns
- > Looping
- > Rolling
- > Zero-g
- > Fight turns
- > Deep dives
- > Low passes

Good Luck

With your family

Two Day event for the whole family!

Wings Over Baltics Airshow 2019 has no age limit! The show is designed to entertain every generation.

It doesn't matter if you are 7 or 77 - you'll certainly find something for You!

Kids attractions, Sky Zoo static aircraft museum, drone zone, expo zone, food zone etc.

Boys don't grow up, their toys just fly higher!

Sky Zoo Museum

The Air Museum "Sky Zoo" has been established at the airport "sky zoo", which is currently displaying aircraft such as as-40, an-2, su22m4, Pzl T-11 spark, helicopter mi-24 which are painted in "animal print colors" and is located at the Jurmala airport. People have the opportunity to find out about the history of the airport, see the airport transformation, and familiarize themselves



with the future development plans of the airport. In the «Sky Zoo» territory people can find such points of interests such as:

- Tower • Runway
- Caponiers • Hangars •
- Technics of engineering
- Technical department
- Exhibits of museum planes.

Even for me, it's hard to express all there is to see with words. I hope that I've share my feelings of excitement with you, so that you are interested in going to see, feel and hear the thrill and passion next year so that we can share the same atmosphere

as aviation fans. They say a picture is worth a thousand words, so really the best thing I can do is to share pictures.

I can't give the same effect of the BMW M5 vs. L39C race, F-16 Falcon power, Baltic Bees Jet Team L39C x7 dance, Jurgis Kairys Solo crazy show (he is 67 years old), Team Orlik x4 ballet, JAS 39 Gripen kidding with sky and all others.

Double the Speed. Double the Power, Double the Adrenaline!

Wings Over Baltics Airshow 2019! 🇸🇪





by Muhammed Yilmaz

Red Bull - Istanbul Beneath Wings

The most entertaining aviation event of the year was reorganized after 6 years. In this spirited competition 35 teams brought together 200 thousand Istanbulites and I got involved in this awesome entertainment by scoring contestants from the jury tower!

Red Bull Flight day was first organized in 1992 in Vienna - Austria and spread around the world after capturing the interest of audiences around the globe. It is considered one of the most entertaining events in aviation history. It started for the first time in Turkey in 2008 with the name **'Flugtag'** and has been held 3 times until 2013. The event was reorganized on August 4th after a 6-year period and gathered nearly 200 thousand spectators at Istanbul Caddebostan Coastline.

Lots of entertaining scenes were witnessed during the competition, where four-person teams tried to cover the longest distance by jumping into the sea over a 6-meter-

high ramp with air vehicles that they completely designed themselves. As a rule, the vehicles designed by the competitors are a maximum of 6 meters wide and 8 meters long and weigh a maximum of 200 kilograms, including the pilot. All vehicles designed must be human-powered. Systems like engines, fuel, battery, electric cables, catapult, etc. are not allowed and this makes the competition even more enjoyable.

While 35 teams demonstrated their shows on the Red Bull Flight Day, there was another surprise waiting for the crowd. Dario Costa, the Red Bull Air Race pilot, took off from Hezarfen Airport to the Caddebostan Coastline and presented an unforgettable show to



the aviation enthusiasts with his private aerobatic plane. The general public also had the opportunity to experience this performance with Costa thanks to his posts on social media.

I was one of the jury members of the event where 35 courageous teams attended adorned with creative costumes, handmade flying vehicles and entertaining shows. The Coffee Lovers team placed first at the competition on Red Bull Flight Day, which certainly created a memorable weekend for everyone.

Çetin Gürer won the 'Pilot Training' award as the pilot of the winning Coffee Lovers team that flew the farthest distance with

a flying vehicle shaped like a coffee scale. The Mother Force team won the second place in the competition and received a prize of watching the Red Bull Air Race on site and the Vecihi Team ranked number three and won a prize of flying with the Flying Bulls at the Salzburg Hangar-7 in Austria. The Uçan Efeleer team flying to the longest distance with 14 meters won the World Tour special prize.

At the Red Bull Flight Day Event, the **Chicken Whisperers** team achieved the longest distance flight recorded in California with **78.6 meters**. The record in Turkey belongs to the **Angara Birds** team achieving a 30-meter flight in 2013.



Global Footprint of TAV Airports Reaches 90 Airports in 28 Countries



TAV Airports, excluding the Atatürk Airport, served 71.6 million passengers in the first nine months of 2019 and achieved an increase of 8% compared to the same period of the previous year.

In the first nine months of the year, TAV Airports achieved a turnover of €592 million, with a 9% rise compared to the same period of the previous year. Following the closure of Istanbul Atatürk Airport, TAV's net profit from its ongoing operations increased by 28% and was recorded as €93,8 million. The company's global footprint reached 90 airports in 28 countries, achieving 31% of EBITDA from service companies.

TAV Airports President and CEO Sani Şener: "We have been exerting efforts to provide our passengers with the best travel experience and add value to the country's tourism in the regions in which we have been performing activities. As TAV, we closed the third quarter as the most effective period in terms of the aviation and tourism sectors, with

good operational and financial results.

Turkey continues to offer all its charming tourism potential with competitive prices and breaks a new record every month based on the number of visitors. The number of foreign visitors has increased by 15 percent compared to last year due to high demand. In general, almost all of the airports in our portfolio experienced a very efficient year in terms of international passengers and such an increase in operations is reflected to our financial results.

The growth of our service companies continues without slowing down. With the most recent operation in our service portfolio -the CIP lounges we launched at JFK Airport in New York-, the global footprint of TAV Airports has reached 90 airports in 28 countries. Today, services constitute 31% of our total EBITDA. The total turnover of our portfolio, excluding Istanbul, increased by 9% in the first nine months of 2019 and reached €592 million. EBITDA, again excluding Istanbul, increased by 2 percent and reached €282 million.

Our net profit from our ongoing operations, excluding Istanbul, reached €98 million with an 8% increase. In the first nine months of 2019, our total net profit was €150 million. The profit increase in our ongoing operations was above the EBITDA growth rate due to the decrease in the volatility of the exchange rate. Such results clearly indicate that our post-Istanbul portfolio, which we call TAV 2.0, continues to create value and grow, and we continue to work to expand this portfolio with profitable inorganic growth opportunities."



Esenboğa Airport - Ankara

What is the CAN'CA Scholarship of Success?



The "CAN'CA Scholarship of Success" is a unique program that provides scholarships, academic and professional mentoring for selected successful students in Istanbul Technical University's Aeronautical Engineering program. The CAN'CA program was founded by Aeronautical Engineer Can Erel, who is a seasoned industry expert who actively engages in cultivating this unique program which is supported mostly by funds from his books "CAN'CA Türkiye'deA Endüstrinin Gelişiminde İz Bırakanlar (CAN'CA Those Who Left A Mark on the Development of Industry in Turkey)" and "CAN'CA Intellectual Projects", in accordance with a protocol among the Istanbul Technical University (ITU) rectorate, each student and Can Erel since 2014.

Yagmur Gençođlu



Yagmur was born on April 3, 1995 in Denizli. She graduated from Galatasaray High School in 2014. In 2018 she graduated from the Department of Aeronautical Engineering at ITU.

In the first year of university, she became the first recipient of the CAN'CA Scholarship of Success Program. During her university years, she took active roles in the ITU Aeronautical and Astronautical Engineering Society and organized the society's first Women Of Aviation Worldwide (WOAW) Week event. She served as the International Board Secretary of the European Association of Aerospace Students between 2016-2017. During her last year of university, she took part in the Very Light Aircraft project which is a joint student project of ITU and Turkish Aerospace. Yagmur continues her graduate studies in Aeronautical and Astronautical Engineering at ITU while working as an Edison Engineer at General Electric Company.

Muhammed Enes Özcan



Enes was born on October 4, 1996 in Kocaeli. He graduated from Dalaman Anatolian High School. In 2019, he graduated from ITU, Faculty of Aeronautical and Astronautics,

Department of Aeronautical Engineering. In the final year of university, he became the seventh CAN'CA Success Scholarship recipient. He took part in many social and professional responsibility projects during his university life. He was the team captain of Gökbörü Unmanned Aerial Vehicle Team. He held positions as the Vice President of Humanities and Economic Development Association, University and Business Cooperation. Currently, he is working as a design engineer in the National Combat Aircraft Development Project at Turkish Aerospace.

Mehmet Can Şen



Mehmet Can was born on June 8, 1996 in Izmir. He completed his high school education at the Special Aegean High School with a full scholarship. In 2014, he entered the Department of Aeronautical Engineering at Istanbul Technical University. He was awarded

the CAN'CA Scholarship of Success as a result of the ranking in aeronautical engineering and interviews. He participated in the AUVSI-SUAS unmanned aerial competition held in the USA during his second year of university as the captain of the mechanical team of the ITUNOM Team. Since the end of the second year of university worked in the field of flight modeling, simulation, and stability in a two person very light aircraft project realized in partnership with ITU-TAI. In June 2019, he graduated from ITU.

Sanem Çaliş



Sanem was born on May 16, 1995 in Kütahya. In 2018, she graduated from ITU, Faculty of Aeronautical and Astronautics, Department of Aeronautical Engineering. In the final year of her university life,

she was awarded the fifth CAN'CA Success Scholarship. She participated in some professional and social clubs like ITU Folk Music Choir. She became a member of the Aircraft Team and participated in international competitions. She continues her graduate studies at the Department of Aerospace at Middle East Technical University while working as an aerodynamic design engineer at the National Combat Aircraft Development Project at Turkish Aerospace since August 2018,

Ferit Nihat Adam



Nihat was born on February 1, 1996 in Ankara. He graduated from Tekirdag Ebru Nayim Science High School in 2014, and he then entered ITU. In the first year of his university life, he became one of the

first scholarship recipients of the CAN'CA Scholarship of Success Program. In 2018, he graduated from the Department of Aeronautical Engineering. Since July 2018, he has been working as a design engineer at Turkish Aerospace and continues his graduate studies in Aeronautical and Astronautical Engineering at ITU.

Said Hamza Baş



Hamza was born on June 6, 1996 in Samsun. He graduated from Hasan Sabriye Gümüş Anatolian High School. In 2019, he graduated from ITU, Faculty of Aeronautical and Astronautics, Department of

Aeronautical Engineering. He continued his double major with the Aerospace Engineering Department of the same faculty. In the final year of university, he became the sixth CAN'CA Success Scholarship recipient. Currently he his graduate studies at ITU, Faculty of Aeronautics and Astronautics.

Mehmet Şahin



Mehmet was born on May 2, 1996 in Usak. He completed his high school education at Usak Şehit Abdulkadir Kılavuz Anatolian Teacher High School. He prepared projects in the field of mathematics over two separate years and received regional degrees in the

"TUBITAK Research Projects" competition and graduated in 2014. In the same year, he entered Istanbul Technical University Aeronautical Engineering Department. During the preparatory year, he was awarded the CAN'CA Scholarship of Success. He did his internships at Turkish Technic and TAI. In 2019, he graduated from ITU. He plans to complete his graduate studies overseas.



Fraport Celebrates its 20th Year in Turkey

Fraport, one of the leading players in the global airport business, celebrated its 20th year in the Turkey market with an event held at the Çırağan Palace.

The added value provided to Antalya over 20 years as well as the benefits offered to the region and to the economy of the city were discussed over the “Economic Impact Analysis”. The event hosted by Fraport Turkey’s Managing Director Bilgihan Yılmaz started with an opening speech from Fraport AG CEO Dr. Stefan Schulte. In his presentation on Fraport, an international airport operator and foreign investor, Schulte spoke of the progress that Antalya Airport has achieved in 20 years illustrated with impressive figures.

Fraport Turkey’s Managing Director Bilgihan Yılmaz gave a presentation on the “Antalya Airport Economic Impact Assessment Analysis”. He stated that 99.7% of the tourists coming to Antalya,



Bilgihan Yılmaz

which has become the Mediterranean’s largest tourism center within 20 years, prefer airway transportation. Considering that 58% of the tourists all over the world and 76.1% across Turkey prefer airway, he mentioned almost all tourists coming to Antalya prefer airway transportation and this is a unique opportunity.

During the event, Jens Bischof, CEO of Sunexpress, Osman Ayık, Chairman of TÜROFED, Ersel Göral, CEO of Istanbul Sabiha Gökçen Airport and Holger Schaefers, Senior Vice President of Fraport AG evaluated the developments in tourism and the aviation sector.

What were the achievements in the last 20 years?

Fraport operates in 30 airports in 4 continents and 11 countries. The total value of assets it manages today is over €8.3 billion and has a terminal area of 2.5 million square meters. Its international portfolio makes Fraport the world’s number 1 airport operator.

Fraport took over the operation of Antalya Airport in 1999 and has hosted 373 million passengers and 2.4 million flights in 20 years. 306 million of these passengers were international and 67 million



Bahri Kesici

were domestic. In 20 years, 1.8 million international and 600 thousand domestic flights were performed to/from Antalya.

While indirect employment figures in 1999 were around 25 thousand, this figure increased by 387% to 122 thousand as of 2018. By 2024, it is expected to rise to nearly 193 thousand. In 20 years, Fraport’s contribution to household income has increased year over year. The revenue achieved in 1999 was US\$ 155 million and it rose to US\$ 762 million in 2018. While the effect of Fraport on Gross Domestic Product was US\$ 878 million in 1999, this figure increased to US\$ 4.140 billion in 2018. The 0.24% contribution to GDP in 1999 rose to 0.53% in 2018.

In 1999, Antalya Airport had a terminal of 10 gates on an area of 60 thousand square meters. Antalya Airport served with the terminal having a total of 60 counters, 12 boarding bridges and 6 luggage

bands, and had a car parking capacity of 40 thousand square meters at that time. Today, there are 39 gates, 28 boarding bridges and 170 counters at the airport with 3 terminals on an area of 180 thousand square meters. Now Antalya Airport has a car parking capacity of 100 thousand square meters and has 16 luggage bands.

Having ranked 28th in Europe in 2003, Antalya Airport is now in 13th place. At the end of the 1990s, Antalya had very limited flight destinations, whereas today there are 254 international flights to 60 countries with 118 airlines.



Dr. Stefan Schulte

In 1999, Antalya ranked 8th amongst the Mediterranean airports with 5 million passengers and today is the leader of the region with 32 million passengers on an annual basis. Having reached the total number of passengers of the full year of 1999 by the month of August 2018, it was a significant record-breaking success. When the figures of the first 9 months of 2019 are examined, a 17% increase was achieved compared to the same period of the previous year, which increased expectations of a new record-breaking success for 2019.

In 2018, the top five countries operating flights to Antalya Airport were: Russia (4.5 million passengers), Turkey (3.7 million passengers), Germany (2.77 million

passengers), Ukraine (729 thousand passengers) and the U.K. (655 thousand passengers).

Antalya has 15% of all airline passengers of Turkey and ranked 3rd in this field. Having 7% of domestic passengers in Turkey, Antalya ranked 5th and with 25% of international flight passengers, it ranked 2nd. With 12% of the total flights in Turkey, it ranked 3rd.

Antalya Airport has invested more than €450 million up until today and Fraport completed the construction of all terminals between 1996 and 2009 with the Build-Operate-Transfer model. Fraport was the successful bidder in the tender worth EUR 2.1 billion covering the period of 2007-2024 and pays a rent of €300 thousand per day for Antalya Airport 🇹🇷



Bilgihan Yılmaz, Ayşe Akalın and Dr. Stefan Schulte



Turkish Technic and Satair Sign Partnership Agreement to Support Airbus Fleet Maintenance

Turkish Technic and Satair have signed a strategic General Terms Agreement (GTA) to facilitate further business growth between the two entities. Under this agreement, Satair will support Turkish Technic with consumable and expendable spares (C&E) for the expanding Airbus aircraft fleet that is maintained by Turkish Technic.

This unique agreement supports both Airbus standard hardware supplied from the Airbus warehouses in Hamburg and C&E material from Satair's global warehouses. This marks an important entry of Standard Hardware to the already established transactions of C&E material between the entities.

With this tailor-made GTA, aircraft part numbers can be added and removed from the GTA in a dynamic manner to reflect real-time planning and forecast input. The flexibility of the GTA provides a customized and unique platform to add products and Stock Keeping Units to the GTA while still allowing the general Terms & Conditions to remain in force. This helps both parties to maintain a very high degree of flexibility while securing good service levels from Satair for Turkish Technic.

The GTA agreement covers a wide range of distribution channels, which provides a reliable single point of contact for all customers and the nearly 290 suppliers managed by Satair. As a result of this agreement, Turkish Technic will benefit from more stock availability, reduced lead-times and performance dedication from Satair, enabling planning improvements, reduced vendor complexity and transactional cost savings.



10th National Aeronautics and Aerospace Engineering Congress Held in Eskişehir

The 10th National Aeronautics and Aerospace Engineering Congress, organized by the Union of Chambers of Turkish Engineers and Architects (UCTEA), Chamber of Mechanical Engineers (CME) at the Taşbaşı Cultural Center of Eskişehir Metropolitan Municipality, took place on October 11-12, 2019.

Following the speeches delivered by Atila TOMSUK, Head of CME Eskişehir Branch and Yunus YENER, Chairman of CME on October 11, 2019, the panel on "Today and the Future of the Aviation and Space Sector" started where Dr. Arsev Erarslan, Dr. Mustafa Cavcar on behalf of Turkish Aerospace and Murat İlker Çelik from Turkish Aerospace participated as panelists.

The Congress was held in total 7 sessions where 20 papers were presented on

"Maintenance, Repair and Renovation Activities in the Aviation Sector", "New Technologies in Aviation Industry", "Custom Software and Applications (I & II)", "Innovative Materials in the Aviation Industry", "Advanced Manufacturing Technologies (I & II)", "R&D Centers and Certification Processes", "Indigenous Air Vehicles".

Serdar Çora, one of the authors of Aviation Turkey magazine, where he is still a member of the Advisory Board, presented his paper on 'Technology and System Tests in Flight Test Platforms' as well as one of the founders & the Chief Advisor of the Editorial Board of Aviation Turkey Magazine, Can Erel, closely followed up the event on behalf our magazine.

The congress was supported by many universities, institutions and organizations.

Turkey's Success in Aviation Security Certified by the ICAO

The International Civil Aviation Organization (ICAO) granted Turkey the "Council President Certificate" for success achieved in aviation security.

According to the assessment made on the basis of the success rate in the audit made by the ICAO to the member states, Turkey was granted a certificate by achieving progress in the success rate of "Implementation of Critical Elements of an Aviation Security Oversight System" which increased from 64.9% to 93.15% in the audits carried out in the years 2008 and 2014.

Since 2015, the ICAO has been granting a "Council President Aviation Security Certificate" to the states that significantly achieve progress in the "Implementation of Critical Elements of an Aviation Security Oversight System" in USAP-CMA audits to encourage member states to attain achievements in security. In order to obtain this certificate, an effective implementation (EI) success rate of at least

15% must be achieved and a minimum of 65 effective implementation successes based on the Global Aviation Security Plan (GASeP) must be achieved. In addition, it is stipulated that there should be no significant Security Concern warning about the member state, and it is necessary to achieve over 65 in operational effective implementation rates.

Stating that Turkey's standards in civil aviation security is much higher than the global average, Bahri Kesici - Director General of Civil Aviation said that Turkey has achieved a 30% increase in effective implementation rate over six years by fulfilling all the requirements of the ICAO's security certificate. Director General of Civil Aviation Bahri Kesici also stated that member states are audited on aviation security periodically by the ICAO and 14 other states achieving over 15% in security aviation implementations were granted certificates, and he thanked DGCA personnel contributing to the receipt of such an important certificate.

Havaş Become the First User of DG AutoCheck at GH Sector in Turkey

Havaş, has become the first user of DG AutoCheck which the International Air Transport Association (IATA) has developed to improve efficiency and safety in dangerous goods acceptance, in the ground handling sector in Turkey.

Providing ground handling services to over 200 airline companies at 31 airports in Turkey, Latvia and Saudi Arabia, Havaş has started using DG AutoCheck tool in warehouse services, a digital solution developed by International Air Transport Association (IATA) for acceptance of dangerous goods in accordance with international standards. DG AutoCheck, which is being used by Havaş for the first time in its warehouse at Istanbul Airport, makes the checks easier in the verifications of all relevant rules in the IATA Dangerous Goods Regulations, in the verification of markings and labels the packaging process and provides more effective management.

Havaş Ground Handling Co. General Manager Kürşad Koçak stated, "We are very glad about our collaboration with IATA and to be the first user of DG AutoCheck for the ground handling sector in our country. The air cargo sector continues to grow rapidly. The volume of the sector is expected to double in the next 20 years. In parallel with this, we are developing our services with new technologies in the age of digital transformation together with our warehouse facilities at Istanbul Airport, which we have doubled in an area of 40 thousand square meters with additional investments. I believe that IATA's DG AutoCheck, which we have started to use in the acceptance of dangerous goods cargo, will increase safety and operational efficiency and bring a new dimension to the air cargo sector in our country. We will continue to invest in innovation to further increase the efficiency of the service we provide to our business partners."

"Putting safety first has always been this industry's priority," said Nick Careen, IATA's Senior Vice President, Airport Passenger Cargo and Security. "By implementing DG AutoCheck in their DGD process, Havaş has demonstrated their commitment to efficiency, compliance and security as well. We encourage others in the cargo supply chain to follow their leadership."



DG AutoCheck, with its extensive database and continuous update support, converts the records held by manual processes into electronic data with its optical character recognition technology and enables automatic document checks according to legal regulations. It minimizes the risk of regulatory fines for non-compliance, allowing the process to be carried out safely and efficiently with shorter processing times.



Turkish National Flag Carrier Adds 787 Dreamliner to its Fleet

Turkish Airline's first Boeing 787 Dreamliner landed in Istanbul Airport on the 26th of June this year. With a ceremony held at Boeing facilities in Seattle, Turkish Airlines authorities added the first 787 Dreamliner to the Turkish Airlines fleet.

Turkish Airlines has announced that up to 30 new Boeing 787-9 Dreamliner aircraft will join the airlines' fleet over the next four years, and each will feature the carrier's bespoke, all-new Business Class Cabins. The Turkish national flag carrier had placed 25 firm + 5 optional orders in the last year for the 787-9 Dreamliner, which will be gradually added to its expanding fleet between 2019 and 2023.

The first flight made with the Dreamliner plane was to Trabzon.

Flight Safety Starts with Healthiness

by Pilot Dr. Kadri Eren

The aviation and medical sector, regulated within the framework of national and international norms, is one of the challenging sectors that requires devotion, tolerates no errors even if the norms are put aside and is of critical importance for society. In this sense, the aviation and medical sectors have similarities.

Academic competence, continuous development, team collaboration, risk understanding, and knowledge sharing are the main common similarities for both sectors.

It is necessary to protect the health of flight crews and to be able to conduct healthier flights, for both airline passengers and crew members. Thanks to valuable medical science professionals, as these individuals are gathered together for the sake of flight safety, we are enabled to understand each other in every sense and to take the opportunity to develop this synergy.

Our duty as enthusiastic professionals of Turkish civil aviation is to continuously improve our existing knowledge and experience and one of our important goals is to ensure the improvement of cooperation established

in order to increase contributions from medical world to the aviation sector.

In line with the above mentioned target, with the congresses, workshops, courses and training hosted by or held with the participation of the personnel of our aviation authority - the General Directorate of Civil Aviation, our universities (University of Health Sciences, Ondokuz Mayıs University, Antalya Science University, Ufuk University), aviation medical centers, airlines (Turkish Airlines, Pegasus Airlines) associations (Aviation Medicine Association, Turkish Airline Pilots Association), the training of the personnel required for Turkish Civil Aviation Medicine and the resolution of major issues are provided. In this context, the national congresses held until today, the last of which was the 5th Turkish Aerospace Medicine Congress held in Izmir on October 4-6, 2019, as well as the support given within the framework of scientific papers and main sponsorships have paved the way to organize refresher training for these personnel and to bring the Turkish Civil Aviation Medicine to its rightful place in the world by bringing

together all aviation personnel.

In a world where flight safety is accepted as starting with "healthiness", we can say that the system established to provide flight safety is more advanced than in most European countries and can be observed among the top ten list in the world. Since it is time to introduce the competency and capacity of the Turkish Aerospace Medicine to the world, the Turkish Aerospace Medical Association applied for the nomination of Turkey to organize the 2nd ICAM (International Conference in Aerospace Medicine) in Istanbul-Turkey in 2022, after the 1st ICAM to be held in Paris in 2020.

If such a world-wide prestigious aerospace medical conference takes place in our country, developments in aerospace medicine will be conveyed to the world from Istanbul, and we will have a chance not only to remind our guests, who will experience the magnificence of our 3rd airport, about the tourism potential of our country but also to share the achievements of our country in aerospace medicine with the world. Moreover, this situation has created a motivation and excitement

in all of the above-mentioned institutions and organizations reporting their full support for the appropriate promotion of our country.

A video presentation was prepared by the Turkish Aerospace Medical Association to ICAM officials explaining the advantages to organize the congress in Istanbul and illustrating the visuals of congress centers, hotels, social programs and touristic sites. M.D. Roland Vermeiren, Head of Health Department of Eurocontrol and amongst the decision makers, who made a presentation about air traffic controls by participating in the 5th Turkish Aerospace Medicine Congress held in Izmir, expressed his explicit support for ICAM 2022 to be held in Istanbul. Upon the positive feedback received during bilateral meetings with authorities, an official application was made for Turkey's ICAM 2022 candidacy.

We would like to thank everyone who contributed to the development of Turkish Civil Aviation Medicine and this nomination process, and we wish that the outcome of ICAM 2022 will be beneficial for our country.

5th Turkish Aerospace Medicine (TASM) 2019 Congress Held in Izmir

A variety of issues were discussed at the Congress which was opened by Deputy Director General of the DGCA Kemal Yüksek, University Health Sciences Rector Cevdet Erdöl and Pegasus Airlines CEO Mehmet Nane. Topics included medical emergencies experienced by passengers and flight crew during flights and at airports, the working environment of air traffic controllers, their medical examinations and medical requirements.

One of the important decisions taken during the Congress, where MD Roland Vermeiren - EASA and Eurocontrol Medical Doctor - was invited as guest, was to internationalize the Congress in the medium term. In addition, it was decided upon to nominate Turkey as a candidate for ICAM 2022 which is scheduled to take place in Istanbul. MD Vermeiren, former president of the Aerospace Medical Association (ASMA), said that he would support Turkey's candidacy for ICAM 2022 and defend this initiative.



TOBB Turkey Civil Aviation Council Meeting Held in Istanbul

The TOBB Turkey Civil Aviation Council meeting was held in Istanbul on October 24, 2019 with the participation of the Director General of Civil Aviation Bahri Kesici.

Airline companies, airport operators, ground services and cargo companies, State Airports Administration, Turkey Airline Pilots Association - TALPA and other relevant organizations attended the meeting of the TOBB Turkey Civil Aviation Council, performing activities to reach a consensus among sectors and to improve cooperation between the private sector and public institutions.

The meeting was chaired by TOBB Civil Aviation Council President Teoman Tosun and views were exchanged on the steps to be taken in line with the needs and expectations of the civil aviation sector. During the meeting, issues regarding Istanbul Airport winter preparations, space

allocation for Antalya Airport aircraft maintenance services, regain of the aircraft that completed their economic lives and removal of the age limit on aircraft were also discussed.

The decisions taken on air cargo activities at the 17th Logistics Coordination Board Meeting were evaluated at the meeting and issues regarding the Ministry of Environment Emission Tax Study, re-regulation of flight personnel compensation, compulsory service in piloting and meeting the TAF's pilot requirements were also reviewed.

During the meeting information was shared that the 2018 sector report prepared by TOBB Civil Aviation Council had been published and made available for access. The report is published every year for the evaluation of the civil aviation sector.

FAI Nominated as Finalist in Air Ambulance Company of Year Award

The Air Ambulance division of German Special Mission Operator FAI rent-a-jet AG has been named as one of three finalists in the 2019 International Travel & Health Insurance Journal's (ITIJ) industry awards – Air Ambulance Company of the Year category. This is the 17th annual ITIJ Awards and marks the third nomination for FAI. The winner will be announced at a prestigious black-tie Global Finale Dinner which takes place on October 31st at The Intercontinental hotel in Malta during the International Travel & Health Insurance Global Conference.

Commenting on the nomination, Volker Lemke who heads up FAI's Air Ambulance Division, said: "We are naturally very



pleased that our work has been recognised. This nomination is further confirmation of our continued commitment to our clients, outstanding service and medical excellence. Regardless of the outcome, I would like to congratulate our team of talented staff who put in a tremendous effort every day for the benefit of the patients who fly with us and our global

client base who support us. I am extremely grateful to them and proud of the entire team.

FAI is the world's largest air ambulance jet operator by revenue, logging far above 10,000 hours per year flying air ambulance missions. The 10-strong fleet which comprises Learjet 60, Bombardier Challenger 604 and Bombardier Global

Express is based at FAI's Headquarters at Albrecht Dürer International Airport in Nuremberg. It is supported by some 200 full time staff plus 50 part-time physicians and paramedics. The company specialises in air support in hostile areas for the world's largest NGO. It currently averages three intercontinental medical evacuations per day for its global client base.



Civil Helicopter Market Presence Grows in South Africa with New Distributorship Agreement

Leonardo announced the signing of a Distributorship Agreement with Absolute Aviation Group in South Africa for the civil and commercial market. The Agreement, which has the potential to be extended to other Southern African nations in the future, includes the AW119Kx single engine, the AW109 GrandNew and AW109 Trekker light twins, the AW169 light intermediate and the AW139 intermediate twin types.

Absolute Aviation Group has also signed a contract for an AW119Kx and an AW109 Trekker, with a commitment to purchase further units from the various models in the next couple of years. Deliveries of the two aircraft are expected in 2020. The order marks the entrance of the AW109 Trekker, the newest light twin model in the Leonardo product range, into the South African market and builds on the significant, well established success of other AW109 variants in the country for a variety of roles. This latest AW119Kx order also grows the presence of the unique single engine helicopter in the country.

A ten-day demo tour of an AW119Kx was recently completed at airports in four different regions in South Africa to showcase its extraordinary capabilities in terms of performance, advanced avionics, reliability, and versatility. The demonstrations have been deemed a significant success by those attending, accounting for nearly 50 operators who have been given the opportunity to experience its best-in-class performance and power margins, the capability to fly and carry out its mission in demanding windy conditions, in addition to its outstanding safety standards.

Leonardo helicopters' success in South Africa is further strengthened by the recent contract for an AW139 helicopter in VIP configuration by a private operator. Over 60 helicopters of various models fly in the country today for both civil and government roles including VIP/corporate transport, emergency medical service, oil and gas, harbor pilot shuttle transportation, utility and naval tasks.



Air India is Decorating its Boeing B-777

National carrier Air India (AI) is all set to celebrate World Tourism Day which is on September 27. To celebrate the day with the theme of 'Celebrating India,' Air India has decorated its Boeing B-777 with India's World Heritage photos.

Mesmerizing pictures of India's historical monuments and wildlife have been used to decorate one of Air India's Boeing B-777 aircraft. The aircraft got its makeover at AI, Maintenance, repair, and overhaul (MRO), Nagpur in Maharashtra.

The aim of this is to spread information about India's historical monuments, wildlife and culture to the world. This is the first time that any aircraft in India has used these gigantic pictures on an aircraft.

Air India has a traditional culture to give a name to every aircraft, and interestingly the above mentioned Boeing B-777 is known as the Jammu and Kashmir aircraft.

Logo Sky completed the decoration of the Air India Boeing 777-337 -ER with 2 Logo Sky personnel in 1 day at Air India's Nagpur, India hangar. Logo Sky, which has been manufacturing and applying plate and livery to many points around the world for more than 25 years, continues its activities in the Asia region as well.



Direct Flight from New York to Sydney

Qantas to Operate 'Project Sunrise' Research Flights

On-board research is being designed in partnership with Sydney University's Charles Perkins Center and Monash University in conjunction with CRC for Alertness, Safety and Productivity. A key element of Project Sunrise is the fact that Non-stop flights from New York and London to Sydney will take around 19 hours each, subject to wind and weather conditions. The data will be used to inform all Sunrise flight planning, including from Brisbane and Melbourne. The aircraft will position from Boeing's factory in Seattle, where they will be collected off the production line by Qantas pilots, and flown to their starting points of New York (for two of the flights) and London (for one flight). Cabins will be fully fitted out and otherwise ready to enter normal commercial service. The flights will take place in October, November and December, in-line with scheduled aircraft deliveries from Boeing. Flights will have up to 40 people (including crew) on board and a minimum of luggage and catering to extend the range of 787-9. Other than crew, those in the cabin will mostly be Qantas employees taking part in testing. No seats will be sold as these flights are for research purposes only. After the flights, each aircraft will enter regular service with Qantas International – with just a few extra miles on the clock. Qantas operates the largest airline carbon offset scheme in the world. This same program will be used to offset all the carbon emissions from these three flights. No commercial airline has ever flown direct from New York to Australia. Qantas has once flown non-stop from London to Sydney in 1989 to mark the entry into service of the Boeing 747-400. That flight had a total of 23 people on board and minimal internal fit-out in order to provide the range. The aircraft, registered VH-OJA, was donated by Qantas in 2017 to the Historical Aircraft Restoration Society near Wollongong, New South Wales.

Including Project Sunrise, the first non-stop commercial airline flight from New York to Sydney landed after 19 hours 16 minutes in the air on the 20th of October. With a total of 49 passengers and crew on the flight, which were observed to run a series of experiments to assess health and well-being onboard. Data from these experiments will be used to help in shaping the crew rostering and customer service of Qantas' ultra-long haul flights in future – including Project Sunrise. Tests



ranged from monitoring pilot brain waves, melatonin levels and alertness, as well as exercise classes for passengers. Cabin lighting and in-flight meals were also adjusted in ways that are expected to help reduce jetlag, according to the medical researchers and scientists who have partnered with Qantas. Arriving in Sydney, Qantas Group CEO Alan Joyce said: "This is a really significant first for aviation. Hopefully, it's a preview of a regular service that will speed up how people travel from one side of the globe to the other. "We know ultra-long-haul flights pose some extra challenges but that's been true every time technology has allowed us to fly further. The research we're doing should give us better strategies for improving comfort and wellbeing along the way. "Night flights usually start with dinner and then lights off. For this flight, we started with lunch and kept the lights on for the first six hours, to match the time of day at our destination. It means you start reducing the jetlag straight away. "What's already clear is how much time you can save. Our regular, one-stop New York to Sydney service (QF12) took off three hours before our direct flight but we arrived a few minutes ahead of it, meaning we saved a significant amount of total travel time by not having to stop," added Mr. Joyce.





Permanent Representative for ICAO

Suat Hayri Aka has been appointed as Permanent Representative of Republic of Turkey for International Civil Aviation Organization (ICAO). Suat Hayri Aka has worked many years as an Undersecretary for Ministry of Transport and Infrastructure of the Republic of Turkey.

Turkish Team: Winner of the Model Satellite Competition

Aykut Üçtepe, scholarship holder from the Modern Education Foundation (ÇEV) and 4th grade student from Istanbul Technical University (ITU) Department of Aeronautical Engineering, won first place in the international model satellite competition held in Houston under the sponsorship of NASA with his team. They defeated 93 teams from around the world and had also been successful in the same competition last year placing third 3rd.

ITU Apis R&D Team's model satellite successfully transferred its payload to the ground by landing with a propeller after it had flown up to 750 meters with a rocket. At the desired height, it separated from its carrier seamlessly. It sealed its victory and won first place thanks to the uninterrupted data transfer and the video captures during the descent of the payload.



Bahri Kesici Appointed General Manager of Civil Aviation

The official appointment of Bahri Kesici, who has been serving for many years as the General Director of Civil Aviation by proxy, has been announced in the Official Gazette dated 15 August 2019. Bahri Kesici has been serving as DGCA for many years.

DHMI General Manager Hüseyin Keskin Appointed

Hüseyin Keskin was appointed as the General Manager & Chairman of the Board at the General Directorate of State Airports Administration on 25 July 2019. Hüseyin Keskin who is highly experienced in the Aviation Industry has previously worked for TGS and IGA.





Gulfstream G500 Earns European Certification

Gulfstream Aerospace Corp. announced the all-new, award-winning Gulfstream G500™ has received its European Aviation Safety Agency certification, clearing the way for European Union registrations and customer deliveries.

“The G500 has been very well received in Europe,” said Mark Burns, President, Gulfstream. “Customers in the region have been drawn to the unprecedented level of technology and innovation in the flight deck and the impact that has on safety and efficiency. In the cabin, they can see the effect technology has on the passenger experience with a rejuvenating environment, advanced ergonomics, award-winning seats, and unmatched comfort.”

Well before the G500 entered service in September 2018, the aircraft had already proven its maturity and capabilities with a score of city-pair speed records set across the world. That number has since risen to 35 and includes Seville, Spain, to Abu Dhabi in 5 hours and 45 minutes; Geneva to Chicago in 8 hours; Doha, Qatar, to Shannon, Ireland, in just over 7 hours and 30 minutes; and Farnborough, England, to Las Vegas in 10 hours and 20 minutes.

The G500 can travel 4,400 nautical miles/8,149 kilometers at Mach 0.90 and 5,200 nm/9,630 km at Mach 0.85. The seat collection available on the G500 was chosen for an International Yacht & Aviation Award for its advanced ergonomics and aesthetics that can be tailored to customers’ design preferences and mission requirements. In addition, the G500 cabin features customized furnishings, a healthy cabin environment and 14 Gulfstream panoramic oval windows.

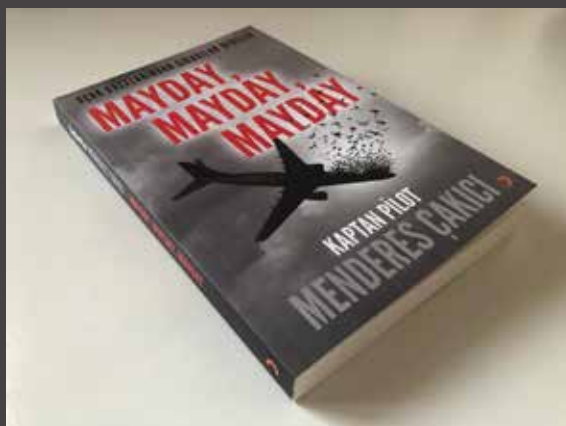
KLM Royal Dutch Airlines Exactly One Hundred Years Old

KLM, founded in 1919, is the first commercial airline that is still flying under its original name to reach this milestone in the world. A true pioneer in aviation, KLM is celebrating its centenary. Throughout the years, KLM has brought the wonder of air travel to generations. In the past 100 years, KLM has grown from a small carrier to a well-recognized global airline. Today KLM operates a fleet of almost 120 aircraft.

Boet Kreiken, Executive Vice President Customer Experience, KLM: “Today, we at KLM celebrate our 100th birthday, so it’s a great moment in time to talk about what we really stand for. We believe in bringing people together. Caring for our passengers. On top of this we also stand for continuous progress. Progress in aviation, obviously, but also progress in a wider sense. Also, we’ve never forgotten the magic of flying. A magic that has been passed on through generations of customers, fans and employees.”

KLM is currently preparing to enter a new phase of operations. The airline is currently in the process of retiring its iconic Boeing 747 aircraft. Meanwhile, the carrier is welcoming several new Boeing 787s. Meanwhile, KLM is currently working with TU Delft’s research into an innovative flight concept known as the “Flying-V”, which embraces an entirely different approach to aircraft design, in anticipation and support of sustainable long-distance flight in the future. The aircraft was originally conceptualized as a potential aircraft design for the future, but can be compared to today’s most advanced aircraft, the Airbus A350.





MAYDAY MAYDAY MAYDAY

After Captain Pilot Menderes Cakici's "Questions in the Air" and "Wings in my Heart" aviation books, the new book, i.e. "Mayday, Mayday and Mayday" was published and promoted to readers.

Pilot Menderes Cakici said: "Today we fly in modern and safe airplanes. There are many airplane crashes that have shaped world aviation history. Here, in this book, you will read the story of important systems that increase the safety of passenger airplanes and prevent technological accidents.

You will breathe the air in the cockpit until the time of the plane crash; you will witness all cockpit communications until the last second. This information was obtained from official final accident reports and the text of the cockpit voice recordings. Airplane accident reports and all documents related to the accident were investigated and examined for you.

You'll read all the details, including what new protection systems have been implemented to prevent similar accidents and how they give you warnings and cautions. One of the six accidents in the book is about Crew Resource Management (CRM). Lessons learned from airplane accidents will continue in series.

I especially hope that the young people who will work as pilots and who do so will learn a lot from this book.

When you gain insight from the mistakes of others, it is assured that others will not have any chance to learn the same lessons from your mistake.

Now you can sit comfortably and safely in your passenger seat. You can enjoy the beauty of the sky while drinking your hot tea or coffee, watching movies on the screen in front of you.

I wish all of us safe and beautiful flights in the blue."

SunExpress Celebrates its 30th Year

SunExpress, a joint venture of Turkish Airline and Lufthansa, continues its successful journey in aviation and tourism that started in 1989 by setting higher standards in the travel industry.

SunExpress has been named Turkey's Best Holiday Airline and World's 5th Best Holiday Airline in 2019 by SkyTrax, Turkey's Safest Airline by SAFA 2019 and Turkey's Second Biggest Service Exporter. The airline commenced its 30th year celebrations by painting one of its aircraft in special anniversary livery.

SunExpress, formerly painted its aircraft to different livery to celebrate cooperation and to make air travel more fun, and now is painting one of its Boeing 737 aircraft to celebrate its own birthday with a special 30th year livery. This year, all aircraft in the airline's fleet will have the same design.

The aircraft that landed in Antalya on October 1, will be a part of a series of events and campaigns to celebrate the airline's 30th Year. As the airline that connects Antalya and Izmir to most domestic and international destinations, SunExpress will proudly fly its newly painted aircraft to different cities around Turkey and Europe with 30-year experience serving its passengers.

Founded by the end of 1980s as a joint venture of Turkish Airlines and Lufthansa, SunExpress aims to support and further the interest of German tourists in Antalya. SunExpress started its operations with just one aircraft, a Boeing 737-300, on 2 April with a flight from Frankfurt to Antalya. After just three years in business SunExpress welcomed its one millionth passenger and expanded its fleet fivefold. Today SunExpress stands as the airline that connects Antalya to the most domestic and international destinations.

As one of the main supporters of Turkey's tourism today, SunExpress operates in 16 destinations in Turkey and 36 cities in Europe. In 2019 alone, by adding 9 new destinations to its network, SunExpress continues to pursue its goal to be one of Europe's most innovative and leading leisure airlines.



Gogo's AVANCE Platform Tops 175,000 Business Aviation Flights

Gogo Business Aviation announces that its AVANCE systems – AVANCE L5 and AVANCE L3 – have now flown more than 175,000 flights totaling more than 108 million miles*. The 175,000 flights is a milestone that took just two years to reach following the initial launch of AVANCE L5 in late-2017 and highlights how extensively the two systems have been used onboard business aircraft of all types and sizes.

Gogo currently has more than 1,000 AVANCE systems – which includes nearly 750 AVANCE L5 and more than 300 AVANCE L3 systems – installed and flying across a wide array of business aircraft, from single-engine turboprops to the heaviest-iron global business jets.

The L5 and L3 systems operate on the Gogo AVANCE platform – a breakthrough combination of hardware and software that is the foundation of all of Gogo's latest inflight connectivity solutions. Because the AVANCE systems are software-centric, it enables a new level of remote, cloud-based service and support. With AVANCE, Gogo can now activate and de-activate features remotely – no license keys or onsite support required – so AVANCE L3 customers now have the ability to choose from one of three configuration options with the ability to transition between those options at any given time, without anyone having to step onboard an aircraft.

The AVANCE L5 connects to the Gogo 4G network delivering faster speeds and enhanced network capacity enabling activities such as live streaming video and audio, video conferencing, on-demand movies, faster web browsing, personal smartphone use, real-time data for cockpit apps, and remote diagnostics and support while in flight. The L5 also provides an upgrade path for anyone who wants to add Gogo 5G when the network launches in 2021.

Early in 2018 Gogo also launched AVANCE L3, a system that delivers the benefits of the Gogo AVANCE platform to passengers and flight departments in a lightweight, smaller form factor compared to L5. AVANCE L3 allows users to customize their inflight experience based on their unique

Collins Aerospace Co-Creates Aviation X Lab with Unique Global Collaboration

Collins Aerospace Systems, a unit of United Technologies Corp. is participating as a founding member of the recently launched Aviation X Lab – a unique, long-term collaboration with Airbus, Emirates Airlines, GE Aviation and Thales focused on delivering the next era of air travel.

Henry Brooks, President, Customer & Account Management for Collins Aerospace stated "At Collins Aerospace, our vision is to collaborate with our customers, partners and innovators to redefine aerospace and deliver what we imagine today as great advancements in air travel for the future. We look forward to bringing our technology and resources to the table as we launch our first challenge round and solicit and validate new concepts that will eventually serve as game-changers in our increasingly connected world."

With a comprehensive portfolio of offerings that enable a more intelligent, more connected and more electric aerospace and defense industry – along with a proven history of numerous industry firsts and a global team of more than 16,000 engineers – Collins Aerospace is uniquely positioned to advance solutions generated by X Lab. Aviation X Lab will identify, support, fund and make the next set of big ideas in the transportation space accessible globally, with a bold vision to positively impact the lives of one billion people. Challenge applications can be submitted by individuals, teams, corporations, academic institutions, start-ups, innovators and activists.

needs and can be installed on business aircraft of all types and sizes but is an ideal solution for smaller aircraft such as turboprops and light jets.

In total, at the end of the second quarter, Gogo Business Aviation reported 5,462 aircraft flying with its air-to-ground (ATG) systems onboard and another 5,099 utilizing satellite connectivity.

TURKISH CARGO WEB PORTAL CONTINUES TO MAKE YOUR BUSINESS EASIER WITH A NEW NAME: **TKG@**



**TURKISH
CARGO**

turkishcargo.com



Turkey and myTECHNIC Growing together

#1000 Aircraft #150 Airlines #50Countries #34Approvals

*Blinking for
a brighter future...*



www.mytechnic.aero