

DHMI

AIR NAVIGATION SERVICE PROVIDER AND STATE AIRPORTS AUTHORITY of TÜRKİYE

ANNUAL REPORT 2021

Route Charges

Berrin TURGUT (Head of Group) • berrin.turgut@dhmi.gov.tr

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Binnur ŞAHİN • binnur.sahin@dhmi.gov.tr
Sevda TURHAN ER • sevda.er@dhmi.gov.tr
Yunus Emre DEMİRCİ • yunusemre.demirci@dhmi.gov.tr

CNS

Gökhan UZUN • gokhan.uzun@dhmi.gov.tr

Performance

Yasin YAVUZ • yasin.yavuz@dhmi.gov.tr Sevda TURHAN ER • sevda.er@dhmi.gov.tr Berrin TURGUT • berrin.turgut@dhmi.gov.tr

Milestones

Sinan DEMİR • sinan.demir@dhmi.gov.tr

Finance

Ufuk KÖKCÜ • ufuk.kokcu@dhmi.gov.tr

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Pictures Ahmet HARMANCI

Design & Cover Theme Kübra YÜCEL

DHMI

Mevlana Bulvarı No: 32 Etiler 06560 Yenimahalle / Ankara - TÜRKİYE T: +90 312 204 20 00 F: +90 312 222 09 76 Call Center: +90 444 34 64 dhmi@dhmi.gov.tr • www.dhmi.gov.tr





The future is in the skies.

S. Otatint

Dear Readers,

Welcome back on board!

The pandemic has led to a stagnation throughout the world in every field and had a huge impact on the global aviation sector. Thanks to innovative implementations activated in this period, the Turkish aviation has passed successfully a very critical exam.

Although restrictions were put into place globally, one flight every 27 seconds was performed in the Turkish Airspace. As regards the number of flights handled amongst ACCs throughout Europe, the Turkish Area Control Centre made us proud by being on the top. Likewise, İstanbul Airport, was on the first place amongst European airports as regards number of arriving/departing flights, passengers and cargo.

During this period, we uninterruptedly continued to prepare for post-pandemic times. Steadily returning to normal, not only maintenance and repair work were continued, but new terminal buildings were inaugurated at Malatya and Kayseri.

We manage an airspace of nearly 1 million km² with our airports fully equipped with state-of-the-art technologies and whilst providing effective service, we put special emphasize on the importance of national products and projects. Our first national surveillance radar project has been completed and we are proud to state that the radar has been put into operation at our Gaziantep Airport.

Another issue to which we attach huge importance is digital transformation and mobility. With this approach in mind, we have developed our mobile application "My Flight Guide".

We constantly endeavour to reach for the top. Compromise on flight safety and aviation security is out of question. Our efforts to ensure a comfortable journey to our disabled passengers have been rewarded with the "Türkiye Accessibility Award". The total number of airports with this award stands currently at 32 and we will ensure that this number keeps increasing to comprise eventually every single airport in Türkiye.

One of the topics that deserves utmost focus is of course the protection of our previous environment. Our motto is "sustainable environment, sustainable aviation" and we will progress with this policy. 49 of our airports have received a "Zero Waste Certificate" from our Ministry of Environment, Urbanization and Climate Change.

We are very proud to know that civil aviation authorities regard DHMİ as a world brand. The success gained up to now will never be taken for granted and we will continue to be the pride of Türkiye with our rewarded work and projects.

Keep buckled up, stay healthy and enjoy our Report!

Hüseyin KESKİN Chairman of the Board Director General

Board of Directors*

Hüseyin KESKİN Chairman Of The Board & Director General

Mehmet ATEŞ Member of the Board

Fatih ÇAKMAK Member of the Board

Gökhan EVREN Member of the Board

Necdet SÜMBÜL Member of the Board

* As of June 2022.





HISTORY

DHMI started its long journey as an airmen training school and the first aeronautical state enterprise in Türkiye, back in 1912. The State Airlines Enterprise, created with the advent of the Republic of Türkiye in 1923, was followed by the Directorate General for State Airlines. The spectacular development of civil aviation made it necessary to separate the functions of air transport and the operation of aerodromes, which were entrusted to Turkish Airlines and the Directorate General of the State Airports Enterprise respectively. After having operated as the Airport Management Company, the State Airports Authority was founded with a new legal status on 8 November 1984 and began its operations and services on 1 December 1984.

LEGAL STATUTE AND OBJECTIVES

As a legal entity that has autonomy over its activities, DHMI is a state-owned enterprise (SOE) that is associated with The Ministry of Transport and Infrastructure. Its liability is limited to its capital. The status of the DHMI has been retained by the latest presidential decree. Established as organisations whose capital belonged to the state, state-owned enterprises are characterised by their public service mission. The objectives of the DHMI are to provide air transport services, to operate aerodromes, to provide ground services at airports and air traffic control services, to install and set up air navigation systems, facilities and other related systems, and to maintain them at a level that meets modern aviation standards.

MISSION

To provide air navigation and airport operation services at international standards. To become a leading establishment that is globally competitive in the field of air traffic management and airport operation.

VISION

MAJOR PRINCIPLES AND VALUES

- » Quality
- » Transparency
- Professional expertise
- Utilization of advanced technology and IT systems
- » Safety and Reliability
- » Environmental awareness
- Passengerfriendliness
- » Productivity
- » Sustainability







AIR NAVIGATION SERVICES

Türkiye has a huge and strategically important airspace with totally 75.245 kilometers of controlled air routes and 982.286 square kilometers of controlled airspace over Europe and Asia continents. Due to its special geographical location, Turkish airspace includes crossroads with north south and east-west traffic flows between Europe, Asia and the Middle East.

Devlet Hava Meydanları İsletmesi (DHMI) is responsible for Air Navigation Services in the Turkish airspace. Civil aviation in Türkiye is the responsibility of the Ministry of Transport and Infrastructure. The Directorate General of Civil Aviation (DGCA) a certified entity designated by the Minister of Transport is the Turkish Regulatory Authority. DHMI Air Navigation Department of Directorate General of State Airports of Türkiye is the unique provider of Civil Air Navigation Services for Türkiye. DHMI is a 100 % State-owned Autonomous State Enterprise and provides all the Air Traffic Services within civil airspace (Controlled Airspace, TMA and CTRs).

One of the main objectives of DHMI is "**to provide air navigation** services for all users in a qualified, balanced, safe, environmental, friendly, fair and economic manner and the development of the air traffic".



DHMI's strategy has two primary focuses:

- » to maintain its level of performance and strives to continuously improve the quality of its services.
- » to steadily develop its position in Europe and to achieve a leading position in the provision of air navigation services in the region.

Realization of DHMI's strategic principles is premised on reaching the following strategic goals

Maintaining high-level air traffic safety,

- » Ensuring competent and highly qualified staff
- » Maintaining top quality services
- » Keeping air traffic delays to a minimum
- » Maintaining economic efficiency at an acceptable level

DHMI also works to achieve Turkish transport policy goals.





ATC UNITS

DHMI's main ATC units are as follows:

- » Ankara ACC: Ankara Area Control Centre provides area control services within Ankara and İstanbul Flight Information Region. It also provides approach control services in Ankara TMA.
- » 47 Aerodrome Control Towers provide both approach control and aerodrome control services (İstanbul, İstanbul Atatürk, İstanbul Sabiha Gökçen Havalimanı, Ankara Esenboğa, İzmir Adnan Menderes, Antalya, Antalya Gazipaşa Alanya, Muğla Dalaman, Muğla Milas-Bodrum, Adana, Trabzon, Isparta Süleyman Demirel, Kapadokya, Erzurum Gaziantep, Adıyaman, Ağrı Ahmed-i Hani, Aydın Çıldır, Balıkesir Koca Seyit, Bingöl, Bursa Yenişehir, Çanakkale, Çanakkale Gökçeada, Denizli Çardak, Elazığ, Erzincan, Hatay, Iğdır, Kahramanmaraş, Kars Harakani, Kastamonu, Mardin, Muş Sultan Alparslan, Samsun Çarşamba, Siirt, Sinop, Sivas Nuri Demirağ, Şanlıurfa GAP, Şırnak Şerafettin Elçi, Tekirdağ Çorlu Atatürk, Tokat, Uşak, Van Ferit Melen, Zafer, Zonguldak Çaycuma, Ordu-Giresun, Hakkari Yüksekova Selahaddin Eyyubi)
- » 4 Aerodrome Control Towers provide aerodrome control services (Eskişehir Hasan Polatkan, Hazerfen, Samsun 19 Mayıs, Efes)

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Responsibilities

DHMI came into existence in 1933, taking the responsibilities of the safety of air navigation within the civil airspace in Türkiye. Its zone of activities extends from ground level to flight level 450. Air traffic control, aeronautical information service, alerting service, planning air traffic flow above Türkiye, training services, publishing and updating aviation publications are just some of numerous DHMI's activity spheres.

The main services provided by DHMI Air Navigation Department are:

Air Traffic Management



- » Air Space Management
- » Air Traffic Services
- » ATM occurrence investigation
- Participation in EUROCONTROL
 and ICAO activities / projects

Airspace design

- » Designing instrument approach and ATS/RNAV routes,
- » Designing departure and arrival procedures from/to Turkish airports by using conventional methods non-conventional methods based on RNAV in accordance with the PBN (Performance Based Navigation) concept
- » Modernising airspace to make air traffic management more efficient, reduce the impact air traffic especially for the environment, and supporting future growth.

Aeronautical Information Management

- » Preparing, publishing and distributing all aeronautical information/data concerning Turkish Airspace and Aerodromes via Turkish AIP,
- Publishing Aeronautical Information Circulars and Pre-flight bulletins,
- » Producing and distributing aeronautical charts,
- » Receiving, issuing and distributing NOTAMs,
- » Controlling the Flight Permission of A/C using the Turkish Airspace and Aerodromes
- » Controlling, distributing and supervising the Flight Plans (FPL)
- » Coordinating SAR activities



Flight Inspection Services	>>	Participating in the design and development process of instrument flight procedures
	>>	Approving instrument procedures,
	>>	Calibrating and validating the signal quality and reliability of facilities (Radars, NDB, VOR, DME and ILS with its two Flight Inspection aircraft flying an average of 900 hours per year).
	>>	Providing transportation of maintenance personnel and/or spare parts in order to achieve in-place repair of a malfunction of radars, navigation aids and communication systems.
	>>	Participating in reconnaissance and evaluation works on the locations of the new navigation aids
	>>	Conducting individual trainings for air traffic controllers on VFR flight patterns and procedures of their aerodromes.
The EUROCONTROL Division	>>	Establishment of the national cost base for en-route charges taking into account all economic developments,
	>>	Collection, validation and exchange to the CRCO of flight data in line with our reporting responsibilities,
	>>	Coordination and follow-up of financial and operational route charges related issues
System Project Development and	»	Solve the problems or the bottlenecks occurring in the current air navigation infrastructures
Assessment	>>	Research new technologies to improve the ATM services
	>>	Follow the latest aviation technology and the projects and participate where available
	>>	Cooperate with national and international research organizations for R&D issues
Air Navigation SMS	>>	Manage the SMS implementation plan
&QMS Division	>>	Facilitate the risk management process that should include hazard identification, risk assessment and risk mitigation;
»	>>	Monitor any corrective action required in order to ensure accomplishment;
	>>	Maintain safety documentation;
	>>	Plan and organize staff safety training;







MOVEMENTS IN THE AIRSPACE AND AT AIRPORTS IN TÜRKİYE

2021 was the year aviation hoped to get back on after the pandemic impacts of 2020.

In 2021, although the number of flights increased inTürkiye, traffic was still below 2019 levels and the impact of the pandemic on traffic continued. Traffic in Türkiye increased by 39% compared to 2020 and reached 1.466.980 flights but remained 28% below the level of 2019. Traffic in 2021 peaked on 25.07.2021 with 3277 flights, which was still 10% below the 2019 levels.

In the first half of 2021, the number of flights in Türkiye remained at a low level, vaccinations and the EU Digital COVID certificate helped the recovery, and traffic has remained stable in the second period of 2021.



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Although Türkiye is one of the least effected States in Europe, traffic stayed below -34,7 % of 2019 levels.

Domestic flights were least affected in 2021 (-14% vs. 2019) and continued to recover in 2021. The largest drop were overflight traffic in Turkish airspace with 82 percent lower according to 2019 but higher then 2021 with 466.266 flights. Domestic air traffic movements were 738.352 with an increase of 28,9 percent. Air traffic in the ECAC area increased by 3,8 percent compared to 2017, air traffic in Türkiye has increased by 5,4 percent in the same period.

In 2021, Domestic flows remain the top flows with 54 % of the flights in Türkiye, 27 % were international flights and the remaining 19% were overflights.

Traffic Composition 2021









IGA Istanbul was the top airport in 2021 with 766 average movements per day over the last year which was % 51 more compared to last year, followed by Istanbul Sabiha Gökçen as second top airport.

RECRUITMENT

The total number of ATCOs employed by DHMI was 1900 for 2021. DHMIs controller recruitment plan continues.

A major training program of ab-initio ATCOs has been underway due to the large increase in traffic and the consequent need to create new sectors to manage this capacity.

In 2021, recruitment campaign started with a press advertisement in October 2021. After the analysis of the applications, 435 applicants were invited to sit a computerized aptitude test, which was held in January 2021. This test is commonly known as the FEAST and was used on license from EUROCONTROL. Candidates succesful at FEAST test were invited to the interviews with top management, then 20 student ATCOs were recruited.



TRAINING

Training means investing in the future. Once again this year, despite the heavy workload, DHMI kept up this principle and managed to ensure high-quality training for all of its trainees.

DHMI provides initial training in both theoretical air traffic management and practical simulator based training. The Basic Training for ATCO trainees was conducted at the Training Centre of DHMI, located at Esenboğa Airport, DHMI conducts basic, refreshment and advanced ATC training programmes. The training center has theoretical training classrooms, laboratories, radar simulator, tower simulator with 3-dimensional and 360 degree monitoring features and pilot control units.

The Air Traffic Control Simulator System consists of tower and approach/en-route control units. The system has the capability of running stand-alone as a tower or radar simulator or in integrated mode where the same scenario can run among all sectors (en-route/ approach/ tower) as in the real ATC environment. Working positions are equipped with ground and approach radar screens, NAV-AID and lighting panels, weather-NOTAM display, strip printers and voice communication systems. The appropriate design of the radar work stations also gives the possibility of non-radar training.

Basic training courses are designed in line with the EUROCONTROL Specification for the ATCO Common Core Content Initial Training. Besides, we have also a vigorous and continuous refreshment training plan covering the present and future needs of ATCOs. In 2021, 3 Basic ATCO training courses completed and the students obtained their licenses.

Regular refresher, development, and emergency courses were provided either by DHMI in cooperation with the EUROCONTROL Institute of Air Navigation Services (IANS).

DHMI also conducts some training courses for staff other than ATC personnel who are working for Electronic Units, Communication, AIS, and other units.







Moreover, as a result of Covid-19 only 20 ANS personnel participated to ATM related courses at IANS, the EUROCONTROL Institute of Air Navigation Services in Luxembourg, in order to increase their knowledge in 2021.

The New Global Reporting Format (GRF), which was implemented by ICAO on November 04, 2021, caused changes in ATC operational procedures. 120-minute conversion training was organized for all air traffic control personnel (TWR,APP,ACC) between 04 October 2021 and 04 November 2021 with the synchronous distance education - where the learning group interacts at the same time to discuss new methodology etc. from different physical ATC unitsmethod. In addition, an electronic library consisting of updated ICAO documents and conference papers within the scope of GRF was established and made available to air traffic control personnel during all phases. In order to raise awareness on the subject, a safety brochure containing key information on the GRF application was prepared and distributed to all ATC units, and shared on the website together with the training document.

Coordination meetings were held with the representatives of DHMI Airport Side, Istanbul Sabiha Gökçen Airport (HEAŞ), Istanbul Airport (İGA), Alanya Gazipaşa Airport (TAV), Zafer Airport (IC içtaş), Zonguldak Çaycuma Airport (Zonguldak Özel Sivil Havacılık Sanayi ve Ticaret A.Ş.) and Eskişehir Hasan Polatkan Airport (Eskisehir Technical University) to developed a standard procedure between ATC and airport operators, and to increase the cooperation with the stakeholders before the implementation date.



AIRSPACE PLANNING

DHMİ has taken necessary measures to ensure the system has the capacity and the redundancy to work in a safe and reliable way. In this context, civil / military coordination, communications infrastructure and surveillance infrastructure were improved, ATC route structure was developed.

In the meantime, to cope with the continuous traffic growth and to satisfy the extra capacity needs, Türkiye has been upgrading the ATM systems through modernization projects and maintenance agreements.

Studies to implement the CDM to enhance the productivity of the İstanbul Airport has been commenced. Study groups were formed and studies have been going on to sign the Memorandum of Understanding.





Beside these projects / studies to increase the capacity of the İstanbul Airport has been going on. With the opening of the third runway of the Airport in June 2020, the new airport became one of the biggest airports in the world with its 150 Million Passenger Annual Capacity.

Also tender for the establishment / construction of second parallel Runway to be used for the simultaneous independent parallel approaches for Istanbul Sabiha Gokcen Airport has been realised. Second runway will be operational in the second quarter of the year 2023 as well.

Airspace Planning and Design studies also continued during the year 2021;

» RNAV SID and STAR procedures were amended / new procedures have been implemented for the İstanbul, İstanbul / Atatürk and Sabiha Gökçen Airports to utilize the ATC Services

New Instrument Approach Procedures, RNP APCH procedures, Standard Arrival Routes, Standard Instrument Departure Procedures based on Conventional and P-RNAV/RNP1criteria were implemented for Milas Bodrum, Çaycuma, Erzurum, Gaziantep, Kayseri, Iğdır, Sinop and KKTC Ercan Airports have been implemented

Implementation of these procedures for the rest of Turkish Airports will be realized in accordance with our plans.

To be able to continue to provide ATC Services efficiently, new Airway structure has been studied and implemented together with our neighbours, ICAO and EUROCONTROL during year 2021.

During this process, on the basis of the agreement between EUROCONTROL and DHMI, a full-scale real-time simulation (RTS) is conducted at the EUROCONTROL Experimental Centre (EEC) in Brétigny.

The aim of this RTS is to establish whether the operational concept supporting a third runway at İstanbul Airport and a second RWY at Sabiha Gökçen Airport can accommodate the expected capacity increase in the Istanbul TMA at an acceptable level of controller performance.

A key element of the new operational environment is the new modes of parallel runway operation triggered by the increase in the number of runways.

The preparations of the RTS concluded in 2019 and 6 week of simulation exercises has been conducted in 2020, the remaining 3 weeks freezed/postponed due to the COVID-19





Quality Management System (QMS)

DHMI meets the requirements to be appointed as the air navigation service provider in Turkish airspace. A Quality Management System (QMS) has been established, documented, applied and maintained by DHMI in compliance with the requirements of the international standards and a certificate was issued to DHMI by Turkish Standards Institution (TSE) the ISO 9001:2000 certificate for its Air Navigation

TSE

Services in 2005. DHMI upgraded the QMS and started the implementation of ISO 9001:2008 in 2010. DHMI applied as well as maintained it in compliance with the requirements of the ISO

9001:2008. The scope of activities covered by the ISO 9001:2008. The services have been managed in compliance with national and international standards.

During 2021, DHMI continued to upgrade its QMS and started the implementation of ISO 9001:2015.

Necessary assessments are carried out annually by the Turkish Standards Institution (TSE) which has been established for the purpose of preparing standards for every kind of item and products together with procedure and service. As a result of the internal assessments made by Quality Management representatives, it was revealed that there were no deviations from the requirements in 2021 proving the validity and efficiency of our system and indicating that we were able to guarantee the best use of our resources. This efficient use of manpower and infrastructure meant that throughout 2021 we delivered services effectively and therefore, met most of our business targets.

The management ensures, by means of the Quality Policy, that user requirements are identified and complied with, in order to increase their measurable satisfaction.

Moreover, DHMI obtains Customer Satisfaction Questionnaire from various airlines to continuously improve services and adequately meet customer expectations in order to ensure the optimal delivery of provisions of the air navigations services every year.

Moreover, DHMI conducts customer appreciation surveys on a regular basis and consults airspace users to ensure a common understanding and to facilitate collaborative decision making.





Safety Management System (SMS)



Safety and safety management remain the overriding objectives for DHMI. Safe working conditions have always been a priority at DHMI.

DHMI's Safety policy is defined in accordance with international and national requirements and reflects organizational commitment regarding safety. DHMI's Safety Policy consists

of; safety priority, safety responsibility, planning for safety, safety standards, safety achievement, safety assurance and safety promotion.

The main component of the SMS is the Safety Management Manual which defines the SMS organization and processes as well as basic SMS procedures, in order to comply with the SMS requirements laid down in national regulations, ICAO requirements, EUROCONTROL Safety Regulatory Requirements (ESARRs) setting out European safety standards. In this respect, DHMI Safety Management System Manual concerning ANS (version 3.2) was issued in 2018.

Since the establishment of its SMS - Safety Management System - DHMI has increased its initiatives to promote a safety culture within the company. This culture is integrated at all levels, so that each employee, especially air traffic controllers, is aware that he/ she can make a difference as far as safety is concerned. That is why in July 2011, DHMI placed ATS SMS Confidential Reporting Form. COREFORM is an electronic reporting system.

DHMI's Safety Commission comprise representatives from relevant departments in HQ under the chairmanship of Head of ANS. Regarding safety matters, the head of commission has a direct access to the Accountable Manager. If necessary the experts from other departments, units or institutions may be employed within the commission. Similar settlement is constituted at all DHMI's airports.

DHMI also join as the EUROCONTROL/CANSO Standard of Excellence in Safety Management Systems (SoE), which assists identifying opportunities to improve the safety management system. Improvement in safety management is strongly supported by DHMI so experts from related departments participate the EUROCONTROL Safety Team and other related working groups. These activities allow to access information regarding the latest developments.

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Incident Investigation

Civil ATM incidents are investigated by the "Investigation and Assessment Commission" which reports incidents and investigation findings to the DGCA. The commission is formed of experts with sufficient qualifications. Where requested by the DHMI and/or if DGCA consider it necessary, experts from DGCA will also join the commission in accordance with SHY 65-02 "Reporting and Assessment of ATM Related Safety Occurrences" which was aligned with the EC directives on investigations of civil aviation accidents.

An investigation team is formed for each incident to investigate the incident, determine the causal factor(s) and propose necessary measures to avoid the repetition of such incidents in the future (e.g. training, new procedures, etc.). The results of the investigations are reported to DGCA.

The causes of occurrences are analyzed to identify the areas which should and could be improved and safety recommendations, interventions and corrective actions are developed to reduce the risk incurred. All appropriate safety data are collected and stored.

There were no accidents in 2021 resulting from DHMI's operations. The objective of zero accidents was met. However, there were seven serious incidents that resulted from our operations. Due to the nature of accidents or serious incidents, they can never be eliminated or predicted with 100% certainty.

While 340 incident reports have been investigated in 2021; 54 of which were classified as ATM related. Appropriate recommendations have been issued for each event and their implementation has been monitored. Actions to be carried out for the implementation of safety nets are underway, like control staff training in the most critical sectors in procedures to avoid or mitigate the main factors detected in incidents.

Accaptable Level of Safety is defined as the number of safety incidents that occurred in the airspace for which DHMI is responsible, weighted according to its severity, in relation to the total number of flights controlled in the Turkish air space throughout the year". Incidents considered as A,B and C severity are those where it is considered that an ATM contribution exists directly by DHMI

DHMI's Flight Safety Goals

DHMI has set the goal of a maximum of tolerable probability for ATM direct contribution incidents at classification A and B per 100.000 movements in Türkiye DHMI meets safety targets for 2021.



Voluntary reporting

Voluntary reporting is encouraged as a best practice in Türkiye. DHMI has two main objectives for Voluntary ATM Occurrence Reporting activities, one of them is the fixing of problems within the shortest time possible and the other is promoting a data driven approach to further safety enhancement activities based on low or medium risk bearing incidents, instead on serious risk bearing incidents and accidents. DHMI has been using ATS SMS Confidential Reporting Form for voluntary reporting.

DHMI has introduced the "just culture". In its commitment to maintain and improve the highest safety standards in the provision of its services, DHMI signed and implemented in its organisation the Just Culture Policy in 2019. Individuals are not prosecuted except in cases of willful deliberate or criminal negligence. It is therefore considered that a "Just Culture" exists in ATC. Incidents are reported by either pilots or ATCOs (through the local management) to the DHMI Headquarter. DHMI Just Culture Policy contains the principles and commitments in relation to Just Culture matters. The achievements of the aims of this policy go further than just its publication, as they include the development and adoption of a series of procedures that sustain it.

COORDINATION and COOPERATION

International Cooperation



DHMI has always given great importance to International Cooperation and to develop its relations with other countries and associations. In this respect, DHMI is fully aware of the benefits of coordination and cooperation among the stakeholders in aviation community and giving a great emphasize to global cooperation in ATM. DHMI is regularly participating and following the events of ICAO, ECAC, EUROCONTROL and CANSO.

Türkiye, as an integral part of the European ATM network and a candidate country for the accession to the European Union, is actively aligning, wherever possible, its national aviation legislation and aviation environment with the SES policy. With regard to the harmonization to the acquis communautaire, DHMI continued to work with Turkish Civil Aviation Authority and the Ministry of Foreign Affairs to review the existing aviation legislations and decide the necessary steps that should be taken.

DHMI has been the full member of CANSO since 2005. In 2011 DHMI has become a member of the European CANSO to the idea of strengthening cooperation amongst ANSP's in the European region. Since then Turkish Air Navigation Service Provider has participated to the CANSO EUR activities.

In 2020 DHMI as an air navigation service providers of associated countries to contribute to the work of the Network Manager, nominated the member of the Netwotk Management Board. Since then DHMI representing non-EU ANSPs in NMB has been participated NMB meetings. Commission adopted on 10 May 2022 the Decision revising its Implementing Decision on the appointments of Members and alternates to the NMB for 2022.





Regional Cooperation



Türkiye maintains very close co-operation/co-ordination with all neighbours to optimize performance.

Türkiye has taken on responsibility of some transition tasks in the area and arranging air traffic flow to / from Europe.

It is also considered that, collaborating as closely as we can with our neighboring civil air navigation service providers has a paramount importance in order to optimize airspace design and management and increase regional capacity, safety and quality. Therefore, Türkiye undertakes initiatives and efforts to ensure the application of same concepts, standards and projects under the EUROCONTROL umbrella.

Modernization Projects

Türkiye has been upgrading the ATM systems through modernization projects and maintenance agreements to cope with the continuous traffic growth and to meet the extra capacity needs.

Studies to implement the CDM to enhance the productivity of the İstanbul Airport has been commenced. Study groups were formed and studies have been going on to sign the Memorandum of Understanding.

There were delays in some ATM/CNS implementation projects due Covid-19 pandemic situation. Because of the local/international travel restrictions imposed by authorities, contractors had to postpone activities or completed it through local entities. For example, ATC software upgrade, which includes some important functionalities were postponed to the second quarter of 2021.



Military authorities also play a major role in managing the Turkish Airspace. Military ATC is entirely separated from Civil ATC, although very good civil/military co-ordination is maintained. Co-ordination between the military authorities and DHMI is ensured through a Civil-Military Co-ordination Group. Some (11) airports/airfields of military origin are jointly used by military and civil aviation. At eight (8) of these airports, all aircraft are under military ATC control.

In order to increase the capacity of Turkish airspace, with implementation of the SMART system, DHMI and the Military Authorities are planning to implement the EUROCONTROL Flexible Use of Airspace (FUA) concept to apply the legislation that has been published at Official Gazette dated 18 April 2014. Studies are going on to establish infrastructure and units.



AERONAUTICAL INFORMATION MANAGEMENT (AIM)



ICAO Annex-15 briefly states that; Each Contracting State shall provide an aeronautical information service to publish aeronautical information/data related concerning the entire territory of the State as well as those areas over the high seas for which the State is responsible for the provision of ATS.

In accordance with this statement, DHMI is the responsible authority for AIM services throughout Turkish Airspace.

Türkiye AIM units receive, assemble, edit, format, publish/store and distribute all aeronautical information/data concerning the State territory as well as those areas over the high seas for which the State is responsible for the provision of ATS through Aeronautical Information Products.

AIM Units have been certified with ISO 9000 since 2005. Our quality policy is to supply timely, effective and safe air navigation service to achieve customer satisfaction at top level and to improve the Quality Management System constantly.

AIM Services in Türkiye consist of;

- » AIM headquarter Offices (AIS/MAP, AIP)
- » 1 International NOTAM Office (NOF)
- » 1 National NOTAM Office
- » 1 FIC (Flight Information Center)
- » 1 Communication Center (COM)
- » AIS/ ARO Offices at 47 Aerodromes
- » Total number of AIM staff: 567

Briefly, the tasks of AIM Services are below;

- » Preparing, publishing and distributing all aeronautical information/data concerning Turkish Airspace and Aerodromes via Turkish AIP,
- » Publishing Aeronautical Information Circulars,
- » Producing and distributing aeronautical charts,
- » Receiving, issuing and distributing NOTAMs,
- » Controlling, distributing and supervising the Flight Plans (FPL)
- » VFR Flights are also followed by DEP, ARR messages
- » Flight permissions for Aircraft to use Turkish Airspace and ADs are granted by Ankara Flight Information Center (FIC) on behalf of Ministry of Transportation and Infrastructure at weekends, public holidays and beyond working hours
- » Evaluating signals about Air Search and Rescue which is transmitted from COSPAS-SARSAT satellite system and coordinate with related bodies.
- » Following emerging international developments about AIM, initiated projects aiming automation and integration.





ATM R&D Management

ATM R&D Projects:

These projects are:

still in progress.

Aircraft Tracking System R&D Project (HATS)



ATC Aerodrome and Approach/Enroute Control Radar Simulator R&D Project (atcTRsim) (Phase 1)



Air Traffic Controller Selection Tool R&D Project (KONSEY)

Avian Radar R&D Project (KU\$RAD MGR) (Phase 1)

ATC Aerodrome and Approach/Enroute Control Radar Simulator R&D Project (Phase 2) (atcTRsim-2)

Remote Training and Information Sharing Portal R&D Project (KONSEY-2)

Avian Radar R&D Project (KU\$RAD - MGR) -KU\$RAD Installation SSR Signal Processing R&D Project

DHMI carries on R&D facilities related to ATM with TÜBİTAK since

2009. 12 of these projects have been completed and 3 projects are

The genuine CWP (Controller Working Position) Development and Implementation R&D Project (Özgün CWP)

FOD Detection R&D Project (FODRAD)

The Modernization of ATM Communication Infrastructure in Türkiye R&D Project (TAMAM)

ATC Aerodrome and Approach/Enroute Control Radar Simulator Atatürk Airport Installation R&D Project (atcTRsim İstanbul Installation)

MGR/Mode-S SSR R&D Project (PSR/SSR Radar Installation at Gaziantep Airport)

ATC PORTAL R&D Project

Air Traffic Control (ATC) System

You may find detailed information about the projects as follows:



Aircraft Tracking System R&D Project (HATS)

DHMI has 2 helicopters used for multi-purposes and DHMI has decided to develop a Project by which it could track its helicopters from take-off to the landing then the specification was prepared accordingly. The system based on transferring the aircraft's position data through GPRS messages and the message transferring is taken over by satellite communication if the GSM signals are not available. In this case the continuous tracking would be possible. It consists of HATS (Aircraft Tracking Device) which mounted on helicopters/ aircrafts and HATM (Aircraft Tracking Center) land-based server system.

Two of the HATS equipment were installed to the DHMI's helicopters, and the works are going on to generalize the usage of the HATS system in Türkiye with different companies.

Avian Radar R&D Project (KU\$RAD -MGR)

The Project is aimed to be used in Airports which are located on the way of the birds' migrating routes. The radar will serve as an early alert to the controller of a possible migrating flock of birds, so that the controller could provide safety separation between the bird flocks and the aircraft. Bird activity is also recorded continuously for statistical analysis that is used to manage the aircraft approach routes, departure and arrival times. The system consists of two radars; one S Band horizontal surveillance pulse radar and one X band



vertically scanning FMCW radar. The system will operate 24/7 detecting and tracking birds, bird flocks and aircrafts, reporting their range, elevation and direction.

In this Project DHMI,

with TUBITAK aimed to have one avian radar system and one PSR (primary surveillance radar) system working on S band for future developments.



The aim of the project is to make the installation of the systems which completed by the KU\$RAD R&D project. Thus, the radar which is developed nationally will be put into operation in a big international airport of our country.

The installation has been accomplished at Atatürk International Airport.

×(~) (29)

KU\$RAD (Avian Radar) Installation R&D Project



ATC Radar And 3D Tower Simulator R&D Project (atcTRsim – Phase-1)

Following the MOC, the ATC Simulator was the first project to start and scheduled to be completed within 30 months. The property rights of developed software will belong to DHMI. Thus, DHMI will be able to deploy these software tools at any airport in order to enhance the number and quality of basic and/or refreshment ATC training facilities.

ATC Simulator has complete systems that meet basic and advanced ATC training requirements and gives important cost and time savings. It supports all levels of radar and tower ATC trainings according to international standards like ICAO and EUROCONTROL. ATC Simulator systems are also interoperable with the other ATM systems. It has fast time performance to manage high traffic loads on multiple exercises.

ATC Aerodrome and Approach/ Enroute Control Radar Simulator R&D Project (Phase 2) (atcTRsim-2)

The installation and implementation of the software developed in phase 1 will be done to the Esenboğa Airport Simulator and training center. It is intended to use the high fidelity visuals and national training materials provided by the systems in the versatile education and work of both candidates or active air traffic controllers (basic ATC refresher, adaptation to the airspace innovation, airspace capacity to work, etc.).

When the installation was completed, the technical infrastructure capacity of ATC Training was increased at least two times.

Air Traffic Controller Selection Tool R&D Project (KONSEY)

In line with ICAO and EUROCONTROL's standards and recommended practices, DHMI has developed, in collaboration with TÜBİTAK, a selection tool which will standardize selection of the candidates of air traffic controllers. The selection software electronically assesses the skills (reflex, three-dimensional thinking, quick decision making,

memory etc.) in safety that an ATC must have. It consists of 12 test applications and a personality test which have the ability of measuring 9 different skills.





Remote Training and Information Sharing Portal R&D Project (KONSEY-2)

By the project which will form the phase 2 of the Air Traffic Controller Selection Software R&D project realized between 2010-2012, it is targeted to prepare the training materials in Turkish which were prepared in English in the first stage and verified by testing on more users and prepare in a unique way. However, the software used as Air Traffic Controller's annual degree renew it is intended to be further developed to respond to all needs.

Within this software, Air Traffic Control Personnel Management System, Web based Training (e-learning) System, Remote ATC Rating Exam System; AIM Personnel Management System, Personnel Management System for ATSEP staff with e-Learning System modules, are available separately.

FOD Detection R&D Project (FODRAD)

The aim of the project is to enhance the runway safety by developing FOD Detection Radars, in collaboration with TÜBİTAK, which provides continuous surveillance in detecting foreign objects on the runways. Before this project runway inspections were followed visually and mostly in a rush manner as the traffic flow allows.



The infrastructure of the FOD radars currently based on radar or optical surveillance or may contain both. DHMI's product have both

capabilities.

The system was successfully installed and tested at Antalya International Airport.



SSR Signal Processing Unit R&D Project

With the adoption of Mode-S radar stations which were provided under the project of renovation of Existing Radars and Procurement of Additional Requirement, most of the old type SSR (Secondary Surveillance Radar)'s used by a period of 20 years, were disabled. A new Mode-S radar is located to Mira Communication station, which is at a higher altitude and alternative to Baspinar SSR Station. After the integration of Mira Mode-S SSR to Interim System, which is still operational, it was found suitable to use the Baspinar SSR as R&D platform after actually switched on.

It is intended to produce the standard ASTERIX CATO48 data format and developing a national signal processing capability of ADS-B with SSR. 10 pieces of ADS-B units were produced and installed at different airports.





The Genuine CWP (Controller Working Position) Development and Implementation R&D Project (Özgün CWP)

The Modernization of ATM Communication Infrastructure in Türkiye R&D Project (TAMAM)



With this project it is intended to produce some sub-systems of an ATM Environment. One of the products is CWP (Controller Working Position), which is called as CARE (Multi-functional Radar Screen). It provides to display ASTERIX formatted data received from radar sources. It also supports the

basic air traffic control functions. The software can visualize detailed airspace information, such as; air corridors, fix points, navigation aid devices and procedures. It can also show drawings of the plans of the airports. Air traffic data which is demonstrated in accordance with the standards can be filtered in some main features by the controllers for an easier traceability. Receiving NOTAM messages can be created on the map automatically and a NOTAM area drawn in a CWP position can be shared with all other CWP positions. Flight plans are categorized as arrival, departure or transit according to area of responsibility of the position. CARE has been installed to 41 Radar airports in Türkiye.

Another product which is developed by this project is EFS (Electronic Flight Strip). EFSs (Electronic Flight Strip System) provides functionality to replace paper strips with electronic strips in a TWR/APP environment. The electronic strips are used to control traffics' flight progress by its user-friendly and highly configurable interface. EFS provides the management of electronic strips by using controller's operational tendency and maintaining situational awareness.

Communications Systems are one of the most important element of CNS/ATM systems. Expression of service quality with the scientific results and how much improvement has been obtained as a result of investments to meet the needs.



It is of great importance to determine the quality of the communications infrastructure such as, Air/space distortion amount on the voice signal for voice communications, the delay of the remote station and the headquarters from the transmission medium, packet loss, beacons, sound signal in the S/N (signal / noise) to measure values such as rate and issues such as the determination of the geographical area infirm in terms of coverage area. It is aimed to develop software tools to help making such tests.

With this project a voice quality analysis system has been developed. The system consists of SQC and SQS software. SQC (Speech Quality Client) records analogue or digital voice calls at the location of the air/ground voice communication line and calculates the quality parameter values of this call according to ITU-T P.563 standard.



ATC Radar And 3D Tower Simulator Atatürk Airport Installation R&D Project (atcTRsim) ATC Radar and 3D Tower Simulator (atcTRsim) developed by DHMI and TUBITAK has been installed at Ataturk International Airport with all the necessary capabilities for both radar and tower control simulations.

It was used as main simulation tool for education of air traffic controllers before the opening of Istanbul New Airport. The system has a 360-degree tower simulator and 4 ground control positions

with 10 pseudo pilot positions for Tower Control. And also, there are 14 controller working positions and 14 pseudo pilot positions for Radar (Approach) control. This project has beed successfully completed and used efficiently during the İstanbul New Airport transition phase.



MGR /Mode-S SSR Radar Development and Installation Project In the civil aviation domain, generally, combined PSR (Primary Surveillance Radar) and SSR radar systems are used. By signing this project, it was intended to develop National Primary Surveillance Radar and Secondary Surveillance Radar with MODE-S capability and then integrate them to gain a combined PSR/SSR Mode-S radar system.

MGR Surveillance Radar System consists of an S-Band fully Solid-State Pulse Doppler Radar (Primary Surveillance Radar - PSR) and an L-Band Enhanced Mode-S Secondary Surveillance Radar (MSSR). The system is developed in order to monitor air traffic and

precipitation level. The system is designed according to ICAO and EUROCONTROL recommendations and standards. Detection and tracking of air targets by PSR are performed up to 60 nautical miles using advanced coherent radar signal processing techniques in different weather conditions. The minimum range of the SSR is 200 nautical miles. The system can simultaneously track up to 1,000 targets via Moving Target Detection (MTD) and Clutter

Reduction capability by using low/ high beam selection, sensitivity time control (STC), adaptive clutter map and Doppler filters. Also, the weather channel can provide 6 levels of precipitation information at 1.4° to 0.95 nautical miles resolution. The system architecture is fully redundant and is optimized for 7/24 continuous operation.









Air Traffic Controller Portal R&D Project (ATC Portal)

ATC Portal (Air Traffic Controller Portal) Project; A modular roster system for Air Traffic Controllers, who ensures the safety, speed and monitoring of flights in the Turkish Airspace, is a project that will enable to overcome the difficulties encountered in personal planning retention of past use and some needs also encountered in personal management.

Remote Training and Information Sharing Portal R&D Project (KONSEY-2), which was previously completed with the cooperation of TÜBİTAK, is a software that enables follow up informaiton such as rate information, incident report, education and health report related to Air Traffic Controllers, training exams and rate renewal exams can be created and information sharing can be made remotely. In addition to the modules to be developed with the ATC Portal System R&D Project, the atcBPS (atc Information Sharing System) will be developed to replace the atcPYS, atcUSS and atcUES systems developed within the scope of the KONSEY-2 R&D Project.



ATC(Air Traffic Control) Systems R&D Project

ATC Systems R&D Project is a national development Project which includes Surveillance Data Processing System (SDPS), Flight Data Processing System (FDPS), Operational Imaging System (ODS), Supervisor Operational Imaging System (SODS), Safety Networks (Safety Nets), ATC Support Software Tools (ATC Tools), Technical Monitoring Control System (TMC), Database Management, Database Management-Software Maintenance-Development Environment (DBM-SDE), Data Link software used in Air Traffic Management. With the National ATC Project, an Air Traffic Management System developed with national facilities will be obtained and it will take our country much further in terms of technologies in the field of civil aviation. This project started at the end of 2021.



Exhibitions Attended in 2021



FODRAD, KUSRAD, EFS, CARE (ÖzgünCWP), MGR, and atcTrsim developed within the scope of R&D projects were exhibited at the TEKNOFEST ISTANBUL 2021 and 3rd Efficiency&Technology Fair. Demonstrations or models of our R&D project products were represented as working systems.

Especially the demo of the Air Traffic Control Radar and Tower Simulator with the visual system in full working has attracted the attention of the participants and their chance to try the system

has increased their interest. All questions about DHMI, which are wondered by the visitors, were answered by the staff of our organization. Although the festival was prepared in a national concept, the foreign participants who visited our stand were also given general information about our products.



35




ROUTE CHARGES



NATIONAL COST-BASE

Tremendous provision of service vs low provision costs DHMI's unit ATM/CNS provision costs are once again significantly lower than the European system average. DHMI unit costs are in the bottom quartile and in line with the underlying economic and traffic demand fundamentals.

This achievement is thanks to firm steps taken by DHMI on some key elements; strict cost containment measures versus a tremendous provision of service, reflected on the figures of costs; which can be summarized as all possible savings in favor of the users of our airspace.

Showing the best performance in cost-efficiency both European wide and regionally has become a true tradition of DHMI.

2021 ACTUAL COST-BASE

Actual costs lower than forecasted The Turkish cost-base has been established in TRL from 2015 onwards and the 2021 cost-base has been realized as 4.104,7 M TRL. Despite limited increases in other cost items, in 2021 Türkiye has experienced the highest inflation rate in the last 20 years, nominal interest rates have reached record levels. This unforeseeable high increase in inflation caused a high rise in the cost of capital thus causing an upward climb in the total costs compared to the estimated figures of 2021.

Although it is obvious that this record level of inflation is beyond the control of DHMİ, the persistence in keeping costs at the minimum level and efficiency targets have not been forgone. The 2021 figures have been kept at the lowest possible level.

This decisiveness in keeping costs at the minimum possible level and persisting on efficiency increases have been limited; staff costs only by 110,6 M TRL, 191,3 M TRL for Other operating costs, while 49,2 M TRY for depreciation costs.

As a result, the 2021 actual cost base has been established as 4.104,7 M TRL. When compared to the estimated figures and considering the record level of the inflation rate (36,1%) and keeping in mind that the forecasted inflation rate was 10,5% the difference between forecasted figures for 2021 and actual figures for 2021 is 778,8 M TRY and translated as an increase of 23,4%. Considering that inflation in 2021 actualized almost four times the forecasted rate, this level of increase in the cost base actually means a respectable saving translated as a limited increase which proves the efficiency and agility in capacity optimization of DHMİ during this unprecedented low demand period.



Comparison of 2020 Foreca			('000 TRL)	
Costs	2021F	2021A	Delta	%
Staff	1.289.652	1.401.268	111.617	8,7%
Other operating costs	1.391.380	1.582.694	191.314	13,7%
Depreciation	346.759	396.004	49.244	14,2%
Cost of capital	298.135	724.763	426.628	143,1%
Total costs	3.325.926	4.104.729	778.803	23,4%

2021 estimated costs vs actuals in brief;

As regards the costs by nature; staff and other operating costs have been calculated as 1.401,3 M TRL and 1.582,7 M TRL respectively, depreciation and cost of capital have been established as 396,0 M TRL and 724,8 M TRL respectively, the total cost base being 4.104,7 M TRL.

Main Parameters - 2021 F vs 2021 A					
	2021 Planned	2021 Actual	Variation	%	
Costs	3.325.925.873	4.104.728.625	778.802.753	23,4%	
Charges billed	3.389.716.815	2.807.287.374	582.429.441	-17,2%	
Total Service Units	13.394.677	10.718.610	2.676.067	-20,0%	

SERVICE UNITS

Due to the Covid-19 Pandemic, air traffic had decreased sharply but has started to recover. The total service units for 2021 has been realized as 10.718.610, just -20% lower than forecasted.

NATIONAL UNIT RATE As can be seen from the below table, the 2023 UR will be affected by the unexpected developments due to Covid-19. It should be underlined that the total impact has been limited significantly with limitations of the costs and the spreading of the huge under-recovery but it is foreseen that the UR will eventually drop to lower levels.

Five Year Plan - Unit	Rates*				(in €)
Year	2023	2024	2025	2026	2027
Unit Rates	35,19	32,78	33,42	33,67	30,23
Variation	15,2%	-6,8%	1,9%	0,7%	10,2%

*Unit rates approved in CE-R Sessions





SERVICE UNITS

Covid-19 has still a serious impact on air traffic and this has put financial pressure on both the users and the ANSPs. Furthermore, the conflicts in neighboring territories triggered the inflation to even worse levels from which Türkiye has already been suffering for a time. Therefore, DHMI is one of the severely affected ANSPs of these developments.

The huge loss of value of the TRL against hard currencies has now in three years' time nearly reached extraordinary levels and the exchange rate is still much fluctuated and very volatile.

Türkiye was already struggling with an economic crisis before the pandemic and other adverse developments. All the economies have been affected by the crisis led by Covid 19 pandemic however without having an opportunity to alleviate the devastating effects of the pandemic, Türkiye has experienced record-high inflation rates caused by the global energy and food crisis mainly triggered by some global conflicts.

Under the current economic conjuncture, it is unavoidable to control the costs because of the devaluation of the TRL and inflation rates reaching record levels. The aggressive increase both in inflation and foreign exchange rates will most probably continue in the coming years and this will inevitably lead to uncontrollable effects on the cost-base which is dependent on these macroeconomic parameters.

Under-recovery from 2020 actuals and its impact;

The significant carry-over stemming from 2021 will have an impact on the rise in the 2023 UR and beyond as an uncontrollable factor. However, if the effects of the service unit variation and carry-over from 2020 are eliminated, the increase of the UR of 2023 without uncontrollable factors would have been only 2,5%.

It should be noted that during these very hard times, all possible measures have been taken to keep the costs as low as possible.

As usual Türkiye is determined to maintain its efficiency targets of which the main one is to keep its unit rate low whilst maintaining high aeronautical performance.





2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027

FORWARD LOOKING INFORMATION

The table below provides forward-looking information relating to the years 2023-2027. The macro-economic indicators projected by the Government, budgetary implementations and variations in market prices have been taken into account in the calculation of these figures.

Five Year Plan					(TRL'000)
	2023 F	2024 P	2025 P	2026 P	2027 P
Staff	3.621.153	4.363.903	4.851.533	5.348.946	5.421.556
Other operating costs	2.272.968	2.730.313	3.034.313	3.345.153	3.400.274
Depreciation	780.863	941.532	1.046.802	1.154.143	1.169.259
Cost of capital	1.272.041	1.538.295	1.710.844	1.886.407	1.906.169
Exceptional items	0	0	0	0	0
Total costs	7.947.025	9.574.043	10.643.492	11.734.649	11.897.258

High service quality, maximum costefficiency & zero ATFM delays

In the period 2023-2027, the increases foreseen in the cost-base will be in parallel to price and consumption expectations.







COMMUNICATION NAVIGATION SURVEILLANCE



COMMUNICATION, NAVIGATION, SURVEILLANCE SYSTEMS (CNS)

DHMI Electronics Department is the main CNS service provider in Türkiye. DHMI provides CNS services by means of Electronics Units at 56 Turkish Airports and Turkish Air Traffic Control Center.

DHMI Electronics Department is in charge of the following tasks:

- » To procure and install navigation aids, surveillance systems, communication systems related to flight safety and to provide a dedicated quality of service for the systems,
- » To carry out conceptual design of projects and technical/ functional specifications of the required ATM/CNS systems and equipment; to prepare periodic maintenance plans for those systems; to execute and monitor these plans,
- » To set up a ground team to work on the flight inspection of the Communication, Navigation, Surveillance systems,
- » To renew, repair, calibrate and modify the systems and test equipments that cannot be repaired on site; to provide necessary stand-by equipment, test equipment and documentation; to plan and perform domestic and international trainings related to these services; to follow the latest technological improvements in order to enhance service and to implement these improvements,
- » To follow the activities at international aviation institutions (ICAO, EUROCONTROL, ECAC, etc.), to coordinate and cooperate with the related units to perform the prepared and approved plans in time; to draw up plans and programs as required,
- » To organize and conduct ATSEP (Air Traffic Safety Electronics Personnel) Basic, Qualification, On-The-Job and Refreshment trainings according to ATSEP License Regulation in place.





SAFETY MANAGEMENT SYSTEM (SMS)

Safety Management System of Electronics (CNS) Department of DHMI was put into process on September 01, 2014 with regard to Doc 9859 (Safety Management Manual) of International Civil Aviation Organization (ICAO), ESARR 3 (Use of Safety Management System by ATM Service Providers) of EUROCONTROL, SHT 65-03 (Guidelines for the Use of Safety Management Systems by Air Navigation Service Providers) that was published by DGCA of Türkiye in accordance with ESARR 3 and SHY-SMS (Regulation on Safety Management System in Civil Aviation) that was prepared by DGCA of Türkiye and was published in the Official Gazette of Türkiye on January 13, 2012.

Purpose of Safety Management System; is to reduce safety risks that may occur in the fields of activity that may affect the flight safety of CNS systems and in all processes to acceptable levels. The highest level of safety is tried to be achieved while the activity is being carried out. In addition, the staff are authorized by the ATSEP license approved by General Directorate of Civil Aviation in order to establish and maintain the safety.

Emergency action plans are prepared for risk analysis of each and every CNS system operated at all sites by DHMI, and internal audits have been carried out annually together with QMS audits. SMS refreshment trainings have been held for all staff (ATSEPs). Approximately 470 staff have been participated refreshment trainings since 2018.

Problems have to be well understood in order to find solutions with which the negative effect of the problems can be reduced or completely be eliminated. SMS focuses on processes rather than outputs and rather than a reactive approach, it implements a proactive approach to prevent problems that may cause accidents, such as dangerous situations. It uses a hazard analysis and risk management system to understand the risk potential of the hazard.

In the scope of the SMS activities; as of 2020, under Directorate General of State Airports Authority and Air Navigation Service Provider of Türkiye, some further studies and workshops have been carried out to implement a well based SDCPS (Safety Data Collection

and Processing System) in CNS Department by taking into consideration both SDCPS related chapters of Annex 19 (Chapter 5); Doc 9859 (Chapter 5) by ICAO and the need of an effective SDCPS within the context of a safer SES (Single European Sky).







QUALITY MANAGEMENT SYSTEM (QMS)

The Quality Management System (QMS) has been established, documented, implemented and maintained by DHMI in compliance with the international standards of ISO 9001: 2015 and with the certificate given by Turkish Standards Institute (TSE). The system is being implemented in Electronics Department and Airports' Electronics Units from January 2, 2013. The Electronics (CNS) Department has been awarded TS-EN-ISO 9001: 2008 certificate by the TSE with license audit conducted between November 4 to November 8, 2013. From this date onwards, TSE conducts document audits every year and document renewal audits every 3 years.

In order to provide a common interface for handling a single Quality Management System upon ATM Resources and Airport Operations within DHMI, DHMI has initiated a multi-departmental project. Hence, a wide training session for ATSEPs has been planned. In 2021, within the scope of the Integrated Management System of DHMI, Electronics (CNS) Department has contributed to the newly established Integrated Management System.

Preventive maintenance activities for CNS systems are performed daily / weekly / monthly / quarterly / annually, and are recorded using specially prepared check and maintenance forms. Moreover, all possible system malfunctions regarding proper functioning based on ICAO/EUROCONTROL requirements, have been recorded and required actions have been taken in scope of QMS.

On the other hand, statistical information about ILS, VOR, DME, NDB and Surveillance Systems and data from NOTAMs are recorded by means of module designed internally.

Internal audits are performed by authorized CNS staff (ATSEP) including Electronic Departments and Airports Electronic Units according to TS-EN-ISO 9001: 2015 Standard.

The total number of ATSEPs employed by the DHMI was 607 for 2021. Staff working on CNS systems have to have a valid ATSEP license issued by DGCA. Licenses are renewed every 5 years. DHMI's responsibility covers training of ATSEP and ensuring the validation of the dedicated licenses.





STAFF

TRAINING

The activities covering preparation of Training Plans and Training Materials in accordance with the regulation and organizing the trainings for technical staff to ensure the air traffic safety is one of the responsibilities of Electronics Department.

Due to Covid-19 trainings were moved to digital platforms. Totally 76 new staff participated in ATSEP Basic training. In total 81 staff completed ATSEP Communication Qualification trainings in 2021. Also 207 staff completed On-The-Job Trainings (Communication 99, Navigation 84 and Survaillance 24). A total of 4 students, 1 Vocational High School students and 3 University Students did internships in 2021 under the Department of Electronics.

In order to improve the knowledge and skills of the flight inspection systems and principles of the navigation aids operating under the responsibility of our organization, 37 personnel received flight inspection training.

COMMUNICATION SYSTEMS

In the standars published by the International Aviation Organizations (ICAO, FAA, EUROCONTROL, etc.); The modernization and renewal of the systems, as well as the planning and maintenance of the national and international terrestrial/satellite network infrastructure connected with these systems, are carried out within the framework of the schedule every year in order to enable radio communication with each aircraft navigating in our airspace at all flight levels.

Communication Systems provided by CNS Department;





- » VCS (Voice Communication Systems),
- » Air/Ground Radios,
- » Ground/Ground Radios,
- » AFTN/AMHS (Aeronautical Fixed Telephone Network / Aeronautical Message Handling System)
- » ATIS/D ATIS(Automatic Terminal Information Service / Datalink ATIS)
- » VSAT(Very Small Aperture Terminal)
- » Cospas Sarsat System,
- » VRS(Voice Recording/Playback Systems)
- » Datalink Sytems,
- » Radiolink Systems,
- » HF-SSB Radios.





VCS (Voice Communication System)

In parallel with the increase in air traffic, the need for capacity increase and modernization has arisen in Voice Communication Systems in HTKM (Air Traffic Control Center), Istanbul (Yeşilköy APP), İzmir (Menderes APP), Antalya APP, Dalaman APP and Bodrum APP in order to carry out air traffic services in a healthy way.

The modernization and capacity increase project of VCS and VRS systems for these locations has been initiated and with this project it is planned to carry out an uninterrupted, continuous and enhanced redundant operation.

Within the scope of the project, the modernization of the VCS and VRS systems in Air Traffic Control Center (HTKM), Istanbul Atatürk, Antalya Airports and Muğla Dalaman Airport was completed in 2021. Modernization process of İzmir Adnan Menderes and Muğla Milas Bodrum Airports and Muğla Dalaman Airport VCS/VRS systems continue.



Air/Ground Radios and Ground/Ground Radios The project for the supply of 550 Air Ground Fixed Radio Devices and 397 Ground Ground Radio Devices to be used in line with the needs of the airports has been initiated.

ATIS/D

ATIS(Automatic Terminal Information Service / Datalink ATIS)

A new ATIS software that supports ICAO Global Reporting Format (GFR) has been developed and the system has been installed at Tekirdağ Çorlu Airport and Trabzon Airport, and has been put into service after the test studies.



AIR NAVIGATION AIDS



In 2021 the following activities have been carried out:

3 DVOR/DME Systems for the needs of Artvin-Rize Airports which is under construction, and Diyarbakır and Batman Airports were sent to the relevant airports, and the facilities were completed and put into service.

The installation work of the system, which was provided for the purpose of replacing the VOR/DME system, which is currently serving at Gaziantep Airport and has completed its economic life, with the new technology DVOR/DME System, continues and will be put into service in the coming days.

A new DVOR/DME station was planned for Gazipaşa Alanya Airport. The necessary procedures for land allocation were carried out and the temporary allocation was obtained. The permanent allocation is being waited for the installation of the systems.

The ILS/DME System has been established to serve at Tokat New Airport and will be put into service after the flight control is completed.

Infrastructure preparations for the ILS/DME System, which is planned to be installed at Artvin-Rize Airport, whose construction is ongoing, are continuing.

A contract of supply and installation of 5 ILS / DME Systems was signed on December 8, 2021 for the needs of Çukurova Airports, which are under construction, and İzmir Adnan Menderes, Balıkesir Kocaseyit and Gaziantep Airports. The systems are at the stage of production and shipment.

The work of the necessary CNS System infrastructure and facility studies for the second runway, which is under construction, of Sabiha Gökçen Airport, has been conducted within the scope of Sabiha Gökçen Airport expansion project.

A great number of constructing demands, which needs to be evaluated in terms of their effects on CNS Systems and Air Traffic Procedures, related with wind power plants, hydroelectric power plants, solar power plants, power transmission lines, buildings etc., have been evaluated and the work of conveying our admistration's opinions to the requesters has been continued uninterruptedly.

As of December 2021; there are 70 ILS, 74 VOR, 147 DME and 68 NDB systems are serving at all the airports and remote stations.





Maintenance and Repair Activities

The faults of the VOR devices serving at Adana, Ağrı Ahmed-i Hani, Antalya, Elazığ, İnebolu, Malatya Stations were repaired and put into service.

The faults of the ILS systems serving at Ağrı Ahmed-i Hani, Elazığ, Erzincan Yıldırım Akbulut, Isparta Süleyman Demirel, Ordu Giresun, Şırnak Şerafettin Elçi Airports were repaired and put into service.

The faults of the NDB devicess serving at Balıkesir Merkez, Elazığ, Erzincan Yıldırım Akbulut, Eskişehir Hasan Polatkan, Kocaeli Cengiz Topel Airports were repaired and put into service.

Studies were carried out on the D-ATIS system serving at Istanbul Airport, and the faults of the ATIS Systems serving at Istanbul Atatürk, Tekirdağ Çorlu Atatürk and Trabzon Airports were repaired and put into service.

The relocation of RWY 36 ILS system in Zonguldak Çaycuma Airport was completed.

VOR, DME and NDB devices were installed and put into service at the New Tokat Airport.

The localizers serving at 35L and 35R runways with the DME serving at RWY 17L ILS system in İstanbul Atatürk Airport were disassembled.

The VOR and DME devices serving in Batman and Diyarbakır Airports were disassembled as part of the renewal.

Installations of VHF/UHF radios at transmitter stations in Isparta Süleyman Demirel and New Tokat Airports were carried out.

The site survey studies were performed in Kahramanmaraş Airport to enable straight in approach and possible offset Localizer approach.





Other Activities

In order to calibrate electronics testing and measuring devices, which are used in CNS Systems, a laboratory has been constituted within the Electronics Department. Totally 1064 testing and measuring devices; i.e.multimeters, scopemeters, frequency meters, wattmeters have been calibrated during the year 2021.

Calibration of the calibrator devices used in the mentioned laboratories has been ensured. A successful cooperation project with TÜBİTAK (The Scientific and Technological Research Council of Türkiye) regarding the measurement methods was carried out.

Within the framework of the signed protocols, Electronics (CNS) services have been provided in Samsun Ondokuz Mayis Airport since November 2018, Selçuk Efes Airport since February 2019, Eskişehir Hasan Polatkan Airport since April 2019 and Hezarfen Airport since February 2019.

The repairation of the cards and modules of 154 radios, 15 VORs, 1 DME and 3 NDB devices have been completed. 96 cards and modules belonging to these devices were repaired under insurance.



Remote Control and Monitoring Project (UYIP)

The main purpose of UYIP is enabling to get access to the main software of VOR/DME systems all over Türkiye in order to control and monitor these systems from a centre in System Installation and Operation Unit located in Esenboğa Airport.

Within this scope, of the project the remote control data infrastructure of VOR/DME Stations are modernized and 77 VOR/DME stations (2 of them in 2020), which are located in/near the airports, have already been connected to this control and monitoring system. The process of connecting all VOR/DME stations to this system has been completed.





SURVEILLANCE SYSTEMS



To provide an accurate and reliable air and ground surveillance picture to Air Traffic Controllers, Electronics Department closely follows new technologies, systems and operations; and adapts innovations its existing ATM infrastructure. Every point above FL200 in the Turkish airspace is covered and controlled with minimum three surveillance sensors.

With the two big projects "SMART (Systematic Modernization of ATM Resources in Türkiye)" and "Renovation of Existing Radars and Additional Requirements" DHMI is able to provide Mode S surveillance information and use the latest ATM technologies.

Beside of the conventional surveillance technologies, DHMI also follows new technologies like ADS-B and Multilateration (LAM/ WAM) to add these new systems' assets to its inventories.

Technical staff attends regular training and courses, organized in Türkiye or abroad. Wiht these trainings, they get the knowledge of surveillance and DP techniques and of maintaining the installed systems.

As of today, 8 PSR (Primary Surveillance Radar) and 25 Mode S MSSR (Monopulse Secondary Surveillance Radar) are in service to provide air surveillance picture. Beside that 14 ADS-B (Automatic Dependent Surveillance-Broadcast) ground receiver is installed and under test process. The locations of these sensors are shown in Map 3.

The data produced by surveillance sensors are transmitted via terrestrial and satellite lines to ATC centers. All sensor data is fed to WAN network and it is shared between ATC centers through this WAN.

In 2021 a new Mode S MSSR system installed to Istanbul Airport and in operation since 3rd quarter of 2021.

Turkish Air Traffic Control Center

SMART ATC systems has been in operation since 7 July 2015 and by the transfer of İstanbul ACC and İzmir ACC sectors to Ankara ACC; Area Control Service in Türkiye has been provided by Turkish Air Traffic Control Center (Ankara).

In addition, İstanbul, Antalya, Adnan Menderes, Dalaman and Bodrum ATC Centers are established for APP services in the Project.

Since consisted configuration and terrestrial digital lines (IP-MPLS-VPN) supported by VSAT allows voice and data network, in case of an emergency/contingency, APP centers can support each other and roles can be shared among them.

ATC Systems are upgraded to include new functionalities such as free route airspace.





Other Systems

A-SMGCS systems with surveillance and safety services are in operation since 2010 at Ankara Esenboğa, Istanbul Atatürk and Antalya Airports. Also A-SMGCS system including EFS/DCL functionalities is available for Istanbul Airport (LTFM). Istanbul Airport A-SMGCS is in use with surveillance and safety services and planned to have routing and guidance services as well.

In order to use the resources (runway, air space etc.) more effectively, AMAN (Arrival Manager) system was installed at Istanbul Atatürk Airport and it is also extended to include Istanbul Airport (LTFM) arrival traffic. DMAN system is also being installed at Istanbul Airport (LTFM) in the scope of A-CDM mechanism.



Future Projects

In the next days/years the following projects are planned:

- » Regional Air Traffic Control Center Surveillance Systems for Istanbul TMA
- » Renovation of 3PSR and 6 MSSR systems which are in operation more than 15 years
- » Country wide ADS-B implementation as complementary to existing surveillance coverage







• PERFORMANCE



TRAFFIC

The Turkish Airspace located at the cross - roads of the main traffic flows between Europe, Caucasian Region, Middle East, Africa and Asia and DHMI is paying utmost importance to bi-lateral and regional cooperation as being one of the main air navigation service provider in the region.

In 2021, DHMİ air traffic volume increased by 39 % compared to the year 2020 but less then 2019 levels due to travel restrictions. Passenger number also increased by 57,1% and reached approximately 128 million passengers.

The COVID-19 crisis has also impacted Turkish airports, Some of airports experienced notably slower recovery in 2021 but IGA, S.Gökçen and Antalya Airports experienced strongest traffic increases. İstanbul IGA Airport is the second airport in Europe according to average daily movements. İstanbul Sabiha Gökçen (7th) and Antalya (12th) Airports in the top 30 airports in terms of average daily movements.



Monthly Traffic

56

CAPACITY



Capacity planning is one of the most important aspects in the provision of Air Traffic Services.

DHMİ has taken necessary measures to ensure that the system has the capacity and the redundancy to work in a safe and reliable way. In this context, civil / military coordination, communications infrastructure and surveillance infrastructure were improved.

In the meantime, to cope with the continuous traffic growth and to satisfy the extra capacity needs, Türkiye has been upgrading the ATM systems through modernization projects and maintenance agreements.

Studies to implement the CDM to enhance the productivity of the İstanbul Airport has been commenced. Study groups were formed and studies have been going on to sign the Memorandum of Understanding. Beside these projects / studies to increase the capacity of the İstanbul Airport has been going on.

Also tender for the establishment / construction of second parallel Runway to be used for the simultaneous independent parallel approaches for Istanbul Sabiha Gokcen Airport has been done.

DHMI has taken all necessary measures to provide ATC Services to this unexpectedly increasing traffic in Turkish Airspace without causing any remarkable delay.

With the increase of traffic in Türkiye, there is a continuously growing demand for capacity at İstanbul/Atatürk, Antalya, Ankara/ Esenboğa, İstanbul/Sabiha Gökçen Airports. Due to an imbalance between the demand for these airports and the availability of adequate airport facilities/infrastructure and airspace systems, slots have been distributed in an equitable, non-discriminatory and transparent way by DHMI since June 2010. To be operationally successful, DHMI ensures close co-operation and coordination with airport authorities and airlines.

All in all, considering the traffic growth and delay situation, it is assessed that the measures taken to enhance and better manage capacity led to an effective increase of ATM capacity and therefore, the capacity plan was achieved and delays were kept at optimum levels.

As a result of the efficient work, despite the sustained substantial traffic growth over the past years, there were no significant en route ATFM delays reported in Türkiye.





PUNCTUALITY

According to DHMI's plan, 0,14 minute/flight target has been defined for 2021. There was no en-route ATFM delay for Ankara. They were significantly lower than the target and still remained below the European average.

İstanbul, Sabiha Gökçen and Antalya took part in the airport arrival ATFM delay within the top 30 airports. But the situation in Istanbul was improved with the opening of the first phase of the Istanbul Airport. Performance at these airports will be continued to be monitored by DHMI.

Arrival ATFM delays at the Istanbul was 0.22 min/arr in 2021. There was also in 2021 a further reduction of airport capacity delays at Istanbul Sabiha (SAW) where the ATFM capacity attributed delays have evolved from almost 10 minutes per arrival in 2016 to 0,39 min/ arr in 2021.

These delays were eliminated through common actions agreed between our FMPs and the NMOC.

As a result, considering the traffic growth and delay situation, it is assessed that the measures taken to enhance and better manage capacity led to an effective increase of ATM capacity and therefore, the capacity plan was achieved and delays were kept at optimum levels.



Average ATFM

58

ENVIRONMENT

SIDs have been designed to provide noise abatement over the most congested areas. Noise monitors have been established and data is being analysed in a noise map pilot project.

There is a legislation regarding maximum noise levels generated by aircraft but no system of enforcement/punitive measures have been developed as yet. Local traffic regulations have been developed in coordination with airport and airline operators



ENVIRONMENTAL AND PASSENGER FRIENDLY INITIATIVES

Sustainable Environment, Sustainable Aviation



Environmentally friendliness has always been one of DHMI's top priorities. Under its motto "sustainable environment, sustainable aviation", DHMI's approach is the utmost responsibility to protect the nature. This is the duty of every single

human being on this planet. This we owe to the next generations.

For this purpose, some of our environment related projects encourage that huge energy saving systems are preferred and moreover especially renewable energy systems are used in every field of service.





Carbon-free Airports



To reduce the negative effects that the environment may be exposed to by our operations at the airports and to leave a better world to live upon to the next generations with measures against global warming and climate change, our Administration has started the "Carbon-free Airport Project".

The Project foresees the compilation of an Emission Inventory Report as well as joint studies in the context of the Airport Carbon Accreditation (ACA) Programme conducted with ACI (Airports Council International) at airports selected as pilot areas where validations are performed according to the related ISO standards.

In addition to Carbon Management, the current ISO 14001 Environmental Management Standard will be applied at the airports and training will be given to ensure awareness both amongst staff and passengers on issues such as noise, waste, waste water and chemicals management.





Million tonnes of CO₂ All Departures from TÜRKİYE

Electrical Vehicles

Numerous studies are continuing to change current vehicles with electrical ones and to widespread the use of electrical vehicles at the airports for ground handling purposes.



Passenger Friendly Airports

DHMI commits itself to the well-being of its passengers and, with a view to ensure that passengers with limited mobility can easily access the airports, has contributed to the project of accessibility initiated by the Ministry of Family, Labour and Social



Services. Following the positive outcome of audits conducted by the Ministry in question, Çanakkale, Diyarbakır, Sivas Nuri Demirağ and Van Ferit Melen Airports were granted this year with the "Accessibility Certificate" bringing to total to 31 Airports. These airports are now carrying flags specially designed for this purpose by the UN.

To avoid noise pollution and provide passengers a peaceful environment within the terminal building.

the announcement system are changed so that only necessary announcements will be made and all other announcements will be delivered to the passengers via specially designed flight information screens.

DHMI "Silent Terminal Project"

"Innovation Airport" Project

In order to meet the requirements of the developing regions, Bursa Yenişehir Airport was chosen as the Innovation Airport to bring, with its innovative structure, a new dimension to the aviation sector. The aim of the project can be defined as to develop services and projects on corporate operations, to provide subsidies to many service activities such as airport cargo



with a view to contribute to the import and export of the region, to establish a pilot infrastructure which may be applied to other airports and to widen the activities to exhibit and promote innovation products relating to the aviation sector.

PLANNED INVESTMENTS TOWARDS THE CONTINUOUS IMPROVEMENT OF PERFORMANCE

DHMI continues its new investments non-stop to prepare for post-pandemic operations

- » Wide Area Multilateration R&D project
- » Mode S/MGR System R&D project
- » ATC Training Complex (Postponed)
- » ATC Portal R&D project
- » Periodic Modernization of navaids & air communication systems
- » Periodic Renewal IT systems (Modernization of Information Network Systems)
- » Renewable energy systems
- » Procurement of calibration aircrafts
- » National ATC Center 1.phase R&D project
- » Surveillance and ATM systems
- » Modernization of CNS systems

ANNUAL REPORT 2021

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FLIGHTS*





GRAND TOTAL **431.376**

EUROPE	246.667
MIDDLE EAST	74.401
RUSSIAN FEDERATION	47.220
ASIA	28.927
AFRICA	21.722
NORTH AMERICA	11.062
SOUTH AMERICA	1.377
OCEANIA	7

Distribution of Total International Commercial Aircraft Movements by Continent - 2021



Statistics & Forecasts	ACTUAL (2020-2021)		FORECASTED (2022-2024)*		
YEARS	2020	2021	2022	2023	2024
Commercial Passengers (Including Direct Transit Passengers)	81.703.685	128.350.222	172.080.183	196.462.511	209.893.689
Commercial Passengers	81.616.140	128.155.762	171.592.715	195.947.126	209.352.632
- Domestic	49.740.303	68.466.177	81.392.726	93.452.296	98.923.275
- International	31.875.837	59.689.585	90.199.989	102.494.830	110.429.357
Direct Transit Passengers	87.545	194.460	487.468	515.385	541.057
Aircraft Movements (Including Overflight)	1.055.168	1.466.860	1.802.553	2.080.278	2.239.830
Aircraft Movements	853.750	1.204.618	1.430.400	1.625.023	1.741.196
- Domestic	572.994	738.352	786.288	893.447	948.920
- International	280.756	466.266	644.112	731.576	792.276
Overflight	201.418	262.242	372.153	455.255	498.634
Freight (Cargo+Mail+Baggage) (Ton)	2.490.521	3.432.517	4.091.273	4.768.001	5.112.390
- Domestic	500.551	698.344	780.442	888.463	942.275
- International	1.989.970	2.734.174	3.310.831	3.879.538	4.170.115
Cargo (Ton)	1.368.577	1.711.151	1.693.937	1.802.771	1.868.355
- Domestic	51.043	106.317	116.026	121.556	123.892
- International	1.317.533	1.604.833	1.577.911	1.681.215	1.744.463

*Revised in April 2022, according to preliminary numbers at the end of March 2022







• MILESTONES



JANUARY 2021

Türkiye Is At The Top Of Europe With 1297 Daily Flights

FEBRUARY 2021

Annual Passenger Capacity Of Malatya Airport Increases To 2.5 Million While the negative effects of the COVID-19 epidemic caused recession in the aviation industry all over the world, Türkiye was among the countries that managed this process most successfully thanks to the effective measures taken. Türkiye ranked first in Europe with 1297 flights that took place in Turkish airspace, including transit flights, in an airspace of approximately 1 million km² controlled by DHMI.

Malatya Airport New Terminal Building has been inaugurated. It is foreseen that the annual passenger capacity will increase from 1,2 million to 2,5 million passengers. Malatya will assume a much more important position as regards air transport. It will contribute to the development of tourism in the region and further enhance mobilize trade activities. The city, which is an important attraction center of the region with its strong socio-economic structure, will become more important in aviation with the projects implemented.

MARCH 2021

Zero Waste Certificate To All Airports Operated By DHMİ A Zero Waste Certificate was given to 49 airports operated by DHMİ.

All airports operated by DHMI received the Zero Waste Certificate within the scope of the Zero Waste Project, which was initiated by the Ministry of Environment, Urbanization and Climate Change, to prevent waste and to use natural resources efficiently. DHMI continues to work with the principle of environmentally friendly and sustainable airports in the management of waste generated at airports.

3 Awards To 3 Airports The Ministry of Family, Labor and Social Services rewards entities with the "Türkiye Accessibility Awards" in order to encourage projects that contribute to the participation of the disabled in social and economic life. In this context, Sivas Nuri Demirağ and Balıkesir Kocaseyit Airports were awarded in the category of "Accessible Public Institutions and Organizations" and Istanbul Airport in the category of "Accessible Workplaces". All 3 airports made us proud again!

APRIL 2021

Uv Rated Hygiene Application At Airports DHMI has added new efficiency measures to combat the new type of coronavirus. The use of devices that ensure the sterilization of passenger baggage and escalator hand grip bands passing through x-ray devices at airports has started. These devices have been developed by TÜBİTAK and were put into service in Erzurum, Gaziantep, Diyarbakır, Hatay, Çanakkale and Trabzon Airports, taking into account the physical conditions of the airport terminals operated by DHMI and the passenger statistical data. At these airports, 20 tunnel type and 27 escalator-belt ultraviolet sterilization devices were installed.



DHMİ Ranks First In
Europe In Air Traffic
Control Service

According to the data of provided by EUROCONTROL, in the first three months of this year, the Air Traffic Center of DHMI ranked first, outstripping Europe's leading Air Traffic Control Centers. Air traffic control services were provided to 139,884 aircraft in the Turkish Airspace in a 3-month period, and was ranked amongst ACCs in Europe. The Air Traffic Control Center continues to be the "eyes and ears of Turkish Airspace and the safe voice of the sky".

Türkiye Ranked First Within European Airports From the day the first COVID-19 case was seen in Türkiye, until April 15, 2021, approximately 73 million passengers received service at the airports. Thanks to the measures taken, the pandemic has been handled in a very successful and effective way

MAY 2021

One Flight Every 27 Second Passed Through Turkish Airspace

88th Anniversary Of DHMİ

Due to the epidemic, the number of passengers at airports all over the world has decreased significantly. Thanks to the measures taken by DHMİ, our passengers can travel safely. These measures have proven to be effective; one aircraft passed Turkish airspace every 27 seconds during the first quarter of the year

DHMİ celebrated its 88th anniversary. DHMİ is getting closer every day to its goal of bringing Turkish civil aviation to the top of the world. While realizing the world's most important aviation projects, DHMI continues to design new projects that enable us to look to the future with confidence. The basis of the success achieved so far is the understanding of quality, safe, comfortable, human and environment-friendly, in short, "passenger-friendly" service at international standards, guided by our 88-year-old history. The negative effects of the Coronavirus (Covid-19) epidemic caused recession in the aviation industry all over the world. Thanks to the innovative practices implemented Turkish aviation passed a successful test in this period. The process was managed very effectively. This success, which was also reflected in the reports of world aviation authorities, made us proud as a nation. By using stateof-the-art technologies to the fullest, we will make effort to sign projects and practices that will set an example for all humanity. We will give priority to developing and implementing national projects in all our works. DHMI is Working, Türkiye is Flying!







Systems Developed By DHMİ With National Resources Attracted Great Attention At The Productivity And Technology Exhibition Organized by the Turkish Productivity Foundation, the "3rd Productivity and Technology Exhibition" hosted national ATM R&D projects developed by DHMİ with masterpieces like MGR (National Surveillance Radar), Air Traffic Controller Training Simulator (atcTRsim), FODRAD (Fod Detection Radar), KUŞRAD (Bird Detection Radar), DHMI Training Management System, AIS Portal, Flight Information System and "My Flight Guide" mobile application system.

JULY 2021

Air Traffic Reached A Peak Of The 4th Of July

Yildirim Akbulut's Name Will Live At Erzincan Airport Air traffic reached a peak with 3,629 flights on July 4th, showing the density of the Turkish airspace. This indicates that our aviation is rapidly recovering from the pandemic. With 324,706 traffic, DHMI Air Traffic Control Center took its place at the top, surpassing the leading ACCs of Europe during the January-June period as well as during the first quarter of the year.

In commemoration of Yıldırım Akbulut, former Prime Minister of Türkiye and Speaker of the Assembly, who was one of the precious statesmen raised by Erzincan who passed away on April 14, the name of Erzincan Airport has been changed as "Erzincan Yıldırım Akbulut Airport". He occupied a precious place in Turkish political history with his respectability and now his name will live forever in his birth region.

SEPTEMBER 2021

State Airports Enterprise At Teknofest With 17 National Projects

OCTOBER 2021

Great Attention To The 12th Transport And Communications Council 'Aviation Sector Panel' DHMI exhibits the systems it has developed with national resources at the "TEKNOFEST Aviation, Space and Technology Festival," which has become the global showcase of national technologies. Visitors were informed in detail about the projects and systems by technical staff. Especially young people showed great interest to the exhibition.

The current situation and dynamics of the transportation sector in Türkiye, future plans, predictions, targets and policies of the sector were discussed and evaluated at the 12th Transport and Communication Council held in Istanbul. At the Aviation Sector Panel, it was emphasized that "Turkish civil aviation is a rising star on a global scale and DHMI is the architect of passenger- and environmental-friendly projects, that closely follow advanced technology applications in every field, constantly raising the quality scale for passenger satisfaction-oriented services, with its modern and large-scale investments realized in cooperation with the private sector".


İstanbul Airport Achieved Great Success In 3 Years İstanbul Airport has received a total of 31 awards and certificates since the day it was opened and is currently among the "Top 10 Airports in the World". It was furthermore rewarded with the "Best Airport in Europe" and "Accessible Airport" awards.

DECEMBER 2021

12 Airports Awarded With International Airport Carbon Accreditation Certificate Intensive studies are carried out to minimize the harm caused by carbon emissions to human health and the environment at environment- and passenger-friendly airports.

Within the scope of the Airport Carbon Accreditation (ACA) Program carried out by the Airports Council International (ACI); Gaziantep, Erzurum, Çanakkale, Balıkesir Koca Seyit, Bursa Yenişehir, Kapadokya, Sinop, Kahramanmaraş, Sivas Nuri Demirağ, Erzincan Yıldırım Akbulut, Adıyaman and Şırnak Şerafettin Elçi Airports were granted a 1st Level Certificate. Efforts to expand the process that started with 12 airports to involve more airports and to reduce carbon emissions from airports are continuing with determination.

Türkiye's Dynamics And Potential Reflected In Air Traffic & Towards Free Route Implementation According to EUROCONTROL data, the number of flights which received air traffic control service in the first 11 months of 2020 was 626 thousand, this number was 896 thousand in the same period of 2021, meaning that civil air traffic increased by 43 percent.

Taking these developments into account, radar simulators developed with national resources are installed at the ACC on the one hand, and air traffic controllers are trained at the EUROCONTROL Innovation Hub, on the other hand. As a result of these studies, a more competitive airspace with the shortest flight route and with the least carbon emission will be made available to airline companies in the near future.

Gaziantep Airport New Terminal Building Opened

The volume of the new terminal building of Gaziantep Airport has been expanded from 24 thousand square meters to 72 thousand square meters. Annual passenger capacity increased from 2.5 million to 6 million, aircraft capacity increased from 12 to 18 and the vehicle parking capacity increased from 585 to over 2 thousand. DHMİ is continuing with its investments to meet passenger requirements of the region.







FINANCIAL STATEMENTS

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FINANCIAL STATEMENTS

The General Directorate of State Airports Administration's (DHMI) balance sheet and income statement for the financial year 2021 were drawn up in accordance with the regulations laid down in the Turkish Uniform Accounting System.

In line with civil aviation activities, our Administration is responsible for air transport, aerodrome operation, aerodrome ground services, air traffic control services, installation and operation of navigation systems and facilities in compliance with economic and social requirements in parallel to the principle of efficiency.

The methods and principles used for the recording of accrual and income obtained for services provided by the Administration are specified in the directive, and all the commercial transactions have been carried out under that directive.

Our Administration's service sales income obtained from air traffic control services, aerodrome ground services and terminal services as required by Civil Aviation Activities, plus other proceeds and profits. At the end of the period, a total gross income of 8.171.044 thousand TRY was obtained, of which 6.867.832 thousand TRY was income from service sales, 1.274.567 thousand TRY was ordinary revenue and profit from other operations and 28.645 thousand TRY was extraordinary revenues and profits. When sales deduction of 585.111 thousand TRY is deducted from this, our income decreases to 7.585.933 thousand TRY which represents an increase of 55,98 % when compared to the net income of 2020.

Under the Uniform Accounting System, service sales are provided in detail according to their respective codes of expenditure. Every service heading is followed by three sub-headings (Air Navigation Services, Ground Services and Terminal Services) as "type of category". Foreign sales represent 26 % of the total sales.

The services rendered in 2021 are gathered in three groups.

- » Air Navigation Services: Air Navigation, AIS publications and other unclassified navigation services.
- » Terminal (Runway, Apron and Taxi-Route) Services: Landing, parking, approach and lighting services, safety precautions against aircraft fire, follow-me services, ground handling, other runway, apron and taxi-route services.
- » Operating Services: Passenger service, service allocation (Office, check-in desks, land etc), electricity-heating-cooling, telephone, diaphone, telex and public address system, Build-Operate-Transfer (B.O.T), load bridge, 400Hz electricity and water, other terminal services.



STATEMENT OF INCOME	(K TL)	
	2021	2020
A. GROSS SALES	6.867.832	4.355.102
1. Domestic Sales	5.102.933	3.456.702
2. Export Sales	1.764.899	898.400
3. Other Sales	0	0
B. SALES DEDUCTIONS (-)	585.111	416.427
1. Sales Returns (-)	0	0
2. Sales Discounts(-)	0	0
3. Other Deductions(-)	585.111	416.427
C. NET SALES	6.282.721	3.938.675
D. COST OF SALES	4.293.964	3.510.342
1. Cost Of Products Sold (-)	0	0
2. Cost Of Merchandise Sold (-)	0	0
3. Cost Of Services Rendered (-)	4.293.964	3.510.342
4. Cost Of Other Sales (-)	0	0
GROSS PROFIT OR (LOSS)	1.988.757	428.333
E. ADMINISTRATIVE EXPENSES (-)	395.929	348.323
1. Research and Development Expenses	12.714	11.625
2. Marketing, Selling and Distribution Expenses	15.396	14.609
3. General Administration Expenses (-)	367.819	322.089
OPERATING PROFIT OR (LOSS)	1.592.828	80.010





STATEMENT OF INCOME		(K TL)
	2021	2020
F. INCOME AND PROFIT FROM OTHER ORDINARY OPERATIONS	1.274.567	888.808
1. Dividend Income From Affiliates	0	0
2. Dividend Income From Subsidiaries	0	0
3. Interest Income	55.808	75.717
4. Commission Income	0	0
5. Provisions No Longer Required	12	464
6. Profit on Sale of Marketable Securities	0	0
7. Foreign Currency Transaction Gain Exchange	1.175.567	784.594
8. Rediscount Income	0	0
9. Other Income and Profit	43.180	28.033
G.EXPENSES AND LOSSES FROM OTHER ORDINARY OPERATIONS(-)	2.107.431	1.648.136
1. Commission Expenses (-)	0	0
2. Provision (-)	15.728	4.461
3. Loss on Sale of Marketable Securities	0	0
4. Loss From Foreign Currency Exchanges	2.087.826	1.624.251
5. Rediscount Interest Expense s	0	0
6. Other Ordinary Expense and Losses	3.877	19.424
7. Net Monetary Gains or Losses	0	0
H. FINANCIAL EXPENSES (-)	8.079	7.246
1. Short Term Borrowing Expenses	8.079	7.246
2. Long Term Borrowing Expenses	0	0
ORDINARY PROFIT OR (LOSS)	751.885	-686.564
I. EXTRAORDINARY REVENUES AND PROFITS	28.645	35.920
1. Prior Period Revenues and Profit	477	80
2. Other Extraordinary Revenues and Profit	28.168	35.840
J. EXTRAORDINARY EXPENSES AND LOSSES	1.411.037	1.426.184
1. Idle Department Expenses and Losses	0	0
2. Prior Period Expenses and Losses	76.276	45.375
3. Other Extraordinary Expenses and Losses	1.334.761	1.380.809
PROFIT OR (LOSS) FOR THE PERIOD	-630.507	-2.076.828
K. PROVISIONS FOR INCOME TAXES AND OTHER LEGAL DUTIES (-)	0	0
NET PROFIT OR (LOSS) OF THE PERIOD	-630.507	-2.076.828



INCOME		(K TL)
	2021	2020
1. GROSS SALES	6.867.832	4.355.102
a. Domestic Sales	5.102.933	3.456.702
b. Export Sales	1.764.899	898.400
c. Other Sales	0	0
2. INCOME AND PROFIT FROM OTHER ORDINARY OPERATIONS	1.274.567	888.808
a. Interest Income	55.808	75.717
b. Provisions No Longer Required	12	464
c. Profit on Sale of Marketable Securities	0	0
d. Profit From Foreign Currency Exchanges	1.175.567	784.594
e. Other Income or Profit	43.180	28.033
3. EXTRAORDINARY REVENUES AND PROFITS	28.645	35.920
a. Prior Period Revenues and Profit	477	80
b. Other Extraordinary Revenue and Profit	28.168	35.840
TOTAL:	8.171.044	5.279.830

EXPENSES AND LOSSES		(K TL)
	2021	2020
1. COST OF SALES AND OPERATING EXPENSES	4.689.894	3.858.665
a. Raw Materials and Supplies	113.356	83.685
b. Staff Wages and Costs Salaries and Other Staff Expenses	2.130.125	1.868.296
c. Outsource Services Expenditures External Utilities and Services	1.183.204	875.661
d. Various Costs Miscellaneous Expenses	576.942	397.503
e. Taxes, Duties and Similar Charges Taxes and Other Fiscal Duties	8.036	4.596
f. Amortization and Depletion Expenses Depreciations and Amortisations	678.231	628.924
2. EXPENSES AND LOSSES FROM OTHER ORDINARY OPERATIONS(-)	2.107.431	1.648.136
a. Provisions (-)	15.728	4.461
b. Loss on Sale of Marketable Securities	0	0
c. Loss From Foreign Currency Exchanges (-)	2.087.826	1.624.251
d. Net Monetary Gains or Losses (-)	0	0
e. Other Ordinary Expenses and Losses	3.877	19.424
3. FINANCIAL EXPENSES (-)	8.079	7.246
a. Long Term Borrowing Expenses (-)	8.079	7.246
b. Long-Term Borrowing Expenses (-)	0	0
4. EXTRAORDINARY EXPENSES AND LOSSES	1.411.037	1.426.184
a. Idle Department Expenses and Losses (-)	0	0
b. Prior Period Expenses and Losses (-)	76.276	45.375
c. Other Extraordinary Expenses and Losses (-)	1.334.761	1.380.809
TOTAL:	8.216.441	6.940.231





ASSETS		(K TL)
	2021	2020
1. CURRENT ASSET	3.254.377	4.666.863
A. Liquid Assets	1.115.999	2.224.306
B. Marketable Securities	0	0
C. Trade Receivables	1.888.329	909.411
D. Other Receivables	8.205	7.140
E. Inventories	125.080	107.297
F. Contract Progress Costs	0	0
G. Prepaid Expenses For Future Months	114.101	1.398.178
H. Other Current Assets	2.663	20.531
2. LONG TERM ASSETS FIXED ASSETS	10.773.747	9.917.484
A. Trade Receivables	275	368
B. Other Receivables	0	0
C. Financial Fixed Assets	0	0
D. Tangible Fixed Assets	10.699.467	9.822.827
E. Intangible Fixed Assets	72.456	89.003
F. Assets Subjects to Amortization	0	0
G. Prepaid Expenses For The Future Years	0	4.914
H. Other Fixed Assets	1.549	372
TOTAL ASSETS:	14.028.124	14.584.347





LIABILITIES		(K TL)
	2021	2020
I. SHORT TERM LIABILITIES	3.798.751	4.975.096
A. Financial Liabilities	195.197	598.787
B. Trade Payables	452.940	2.192.313
C. Other Liabilities	15.315	12.924
D. Advances Received	111.935	90.141
E. Contract Progress Income	0	0
F. Taxes Payable and Other Fiscal Duties	179.204	92.292
G. Provisions for Duties and Expense	60.480	40.197
H. Income Relating to Future Months	2.783.676	1.948.442
I. Other Short Term Liabilities	4	0
II. LONG TERM LIABILITIES	2.288.796	1.038.167
A. Financial Liabilities	0	0
B. Trade Payables	0	0
C. Other Liabilities	0	0
D. Advances Received	0	0
E. Provisions for Debts Expenses	491.181	316.881
F. Income Relating to Future Years	1.797.615	721.286
G. Other Long Term Liabilities	0	0
III. SHAREHOLDERS EQUITY CAPITAL	7.940.577	8.571.084
A. Paid-In Capital	10.647.912	6.156.851
B. Capital Reserves	0	648.032
C. Profit Reserves	0	1.053.610
D. Retired Earnings	0	0
E. Losses From Previous Years (-)	-2.076.828	2.789.419
F. Net Profit (Loss) For The Period	-630.507	-2.076.828
TOTAL LIABILITIES (SOURCES):	14.028.124	14.584.347





CASH FLOW STATEMENT		(K TL)
	2021	2020
A.CASH AT THE BEGINING OF THE PERIOD	2.224.306	2.170.730
B.CASH INFLOWS WITHIN THE PERIODS	7.759.233	7.279.567
1. Cash From Sales	5.303.896	5.720.051
Net Sales	6.282.721	3.938.675
Decrease in Trade Receivables	0	1.781.376
Increase in Trade Receivables (-)	978.825	0
2. Cash From Other Operations	215.751	216.802
3. Cash Received From Extraordinary Income and Profit	20.232	28.900
4. Cash From Increase in Short Term Liabilities	939.808	767.942
Securities Issued	0	0
Credits Obtained	0	0
Other Increase	939.808	767.942
5. Cash Received From Increase in Long Term Liabilities	1.250.628	135
Issuance of Securities	0	0
Credits Obtained	0	0
Other Increases	1.250.628	135
6. Cash Received From Share Capital Increase	0	0
7. Cash Received From Share Premium	0	0
8. Other Cash Received From Cash Inflows	28.918	545.737
C.CASH OUTFLOWS WITHIN THE PERIOD	8.867.540	7.225.991
1. Cash Outflows Due to Costs	4.013.948	2.914.730
Costs of Sales	4.293.964	3.510.342
Increase in Inventories	17.783	29.707
Decrease in Trade Payables	363.850	10.674
Increase in Trade Payables (-)	13.346	37.039
Expenses not Requiring Cash Payments such as Depreciation and Provisions(-)	648.303	598.954
Decrease in Inventories(-)	0	0



CASH FLOW STATEMENT		(K TL)
	2021	2020
2. Cash Outflows Due To Administrative Expenses	366.002	318.353
Research and Development Expenses	12.714	11.625
Marketing, Selling and Distribution Expenses	15.396	14.609
General and Administrative Expenses	367.820	322.089
Expenses not Requiring Cash Payments such as Depreciation and Provisions-(-)	29.928	29.970
3. Cash Outflows Related to other Expenses and Losses	1.190.639	929.028
Ordinary Expenses and Losses	2.107.431	1.648.136
Other Expenses and Losses not Requiring Cash Payments(-)	916.792	719.108
4. Cash Outflows Due to Financial Expenses	0	0
5. Cash Outflows Due To Extraordinary Expenses and Losses	1.372.671	1.330.827
Extraordinary Expenses and Losses	1.411.037	1.426.184
Expenses and Losses Not Requiring Cash Payments(-)	38.366	95.357
6. Cash Outflows Due To Investment in non-current assets	1.520.690	840.771
7. Cash Outflows Due To Short Term Liability Payments	403.590	0
Current Maturities of Marketable Securities	0	0
Principal Payments of Marketable Securities	0	0
Other Payments	403.590	0
8. Cash Outflows Due To Long Term	0	0
Current Maturities of Marketable Securities	0	0
Principal Payments of Marketable Securities	0	0
Other Payments	0	0
9. Taxes and Other Similar Charges Paid	0	424.464
10. Dividends Paid	0	0
11. Other Cash Outflows	0	467.818
D. CASH AT THE END OF THE PERIOD (A+B-C)	1.115.999	2.224.306
E. INCREASE OR DECREASE IN CASH (D-A)	-1.108.307	53.576





GRANT THORNTON

INDEPENDENT AUDIT REPORT

The independent audit has been conducted by the audit and accounting company "Grant Thornton" in line with the Independent Auditing Standards which are part of the Turkish Auditing Standards as set by the Public Oversight, Accounting and Auditing Standards Authority (KGK) established under Decree Law 660.

The resulting audit report states that, apart from some minor issues relating to the confidential BOT and ROT contracts which are not presented for confidentiality reasons, the enclosed financial tables reflect properly the financial situation of DHMI as at 31 December 2021 and, in accordance with the Turkish Financial Reporting Standards, present fairly from every aspect the financial performance and the cash flows recorded in the accounting period ended at the same date.

Signed and stamped by

Grant Thornton Independent Auditors





"When everything seems to be going against you, remember that the airplane takes off against the wind, not with it."

Henry Ford

MOTTO OF THE YEAR

"Culture is the widening of the mind and of the spirit." Jawaharlal Nehru -Former Prime Minister of India

UNESCO declared 2021 as the year of "Yunus Emre, Hacı Bektaşi Veli and Ahi Evran"



Yunus Emre (1238-1328) was a great Turkish thinker and poet who has been a leading light for humanity for centuries with his suggestions to adopt the values of patience, satisfaction, tolerance, generosity, goodness and virtue in line with the teachings of Islam. Yunus, in most of his

poems declares his great love for God. He has felt the elusive excitement of the love of God and also made others feel it. He is known to have been a Sufi (Islamic mystic) who sat for 40 years at the feet of his master, Tapduk Emre. Yunus Emre was well versed in mystical philosophy, especially that of the 13th-century poet and mystic Celaleddin Rumi. Like Rumi, Yunus Emre became a leading representative of mysticism in Anatolia. He has always been the carrier of Islam's messages of faith, love, hope and justice that transcend time and space.

"A heart makes a good home for the friend"



Haji Bektashi Veli (1209-1271) played an important role in the formation of cultural unity and central authority in Anatolia. Some holy men migrated to Anatolia, settled on mountains and empty crossroads and opened dervish lodges there. These institutions gradually became centers for

culture, development and religious thought. In this manner, religious congregations spread everywhere, rules of morals, good bringing up, attitudes and beliefs reached a high standard, knowledge and science were both produced and spread in these centers. He is one of the great saints of Anatolia. His tolerance and human love based philosophy reached many people, and were taken up by them in the important center of Christianity of Cappadocia. His thoughts are based on human love and human existence.

"The beauty of the face consists of the words you speak"



Ahi Evran (1171-1261) is a Turkish philosopher who founded the "Ahi-order". He was born in the district of Hoy in Azerbaijan. After he was educated in Azerbaijan, Khorasan and Bagdat, he moved to Kayseri in Anatolia and established Ahi-order there and provided its organization

through many cities in Anatolia. He lived in Konya and Denizli for a while and settled in Kırşehir until his death. Ahi means "brother" in Arabic language while Ahi-order is the name of the organization that gathers craft and merchant masters in the territory from Anatolia to Central Asia under a single roof and supports them in any kind. It is closely related to "brotherhood" and a combination of "artisanship, trade and profession" with "maturity, morality and truth". The person called "Ahi" is definitely an artisan man, a merchant or a profession owner, besides he is mature, well-behaved, charitable as well as honest and confidential in his works and behaviours.

Take care of your spouse, your job, your life"



Legendary Histories

Edibe Subaşı Kutucuoğlu

First Acrobatics Pilot of Türkiye (1920-2011)

Edibe was discovered by Atatürk during one of his visits to Adana when she was a just a high school student. Seeing in her eyes the love for aviation, he encouraged her to take flying lessons.

She took her first lessons at the Eskişehir flying school.

Edibe was one of the four female pilots trained by Sabiha Gökçen, Turkey's first female pilot. She performed her first flight on the age of 15. She flew to Greece and continued to Italy. Staying in the air for five hours with a sailplane, she was the first person in Türkiye to be rewarded with a silver C pilot's licence.

Over the years, she became one of the architects of the acrobatics team "The Turkish Stars" which was composed within the Turkish Air Force.

She lived for some time in the Netherlands and the USA. She got married with a pilot, who unfortunately died in a plane crash.

Acrobatics does not go without risks of course. In 1957, when performing flights in the training zone, a crash by one of the students caused lots of fractures and terrible burn injuries all over her body from which she could recover in only two years' time during which she was confined to bed. She retired after this incident and said goodbye to the sky.

She parachuted for 104 times!