

Special edition – 2019

transmission

The DFS magazine

Where Scotland meets the world

DFS subsidiary Air Navigation Solutions at Edinburgh Airport

A lesson in geography

DFS Aviation Services at Dortmund Airport

“I have to go where the customers are ...”

FREQUENTIS DFS
AEROSENSE

New additions to the family

The DFS Group is changing and expanding to reflect its dynamic environment. Our newest subsidiary is Droniq.

Dear reader

A long time has passed since the work of DFS Deutsche Flugsicherung (DFS) was focused solely on the sovereign task of providing air traffic control.

Beyond this core business, DFS is now active on the national and international stage with its commercial business. The commercial business is the response of the DFS Group to the dynamic market environment it has found itself operating in. Organisationally, the commercial business is managed by the subsidiaries DFS has founded and the companies DFS holds stakes in.

In this edition of *transmission*, you will find out more about the commercial subsidiaries of the DFS Group. Some of these companies are established companies in their markets and have been operating for a long time, such as Flight Calibration Services, which offers flight inspections. Others are very new – Droniq, for instance, was set up only a few months ago. Droniq was started up because, in the future, the classic task of air navigation services will be supplemented by the need to integrate unmanned aircraft systems, commonly known as drones.

Despite all the work we are putting into these new ventures, our core task of air traffic control will always remain our top priority. It will remain the overriding objective throughout the DFS Group, whether in the parent company or in our subsidiaries, whether in Bahrain, Edinburgh or Langen.

The DFS Group can only remain successful if we operate in the top tier, and we can only do so if we are prepared to learn and measure ourselves against the best. By offering our products and services internationally we are exposing ourselves to a wealth of opportunities to learn how others approach things and see how we measure up.

From our side, it is our hope that in this edition of *transmission* you will find a wealth of learning opportunities from how the companies of the DFS Group handle things. If any of the articles in this

edition pique your interest, feel free to get in touch with one of our subsidiaries directly or the parent company DFS itself. You will find the contact details after each article.

I hope you enjoy reading our magazine.

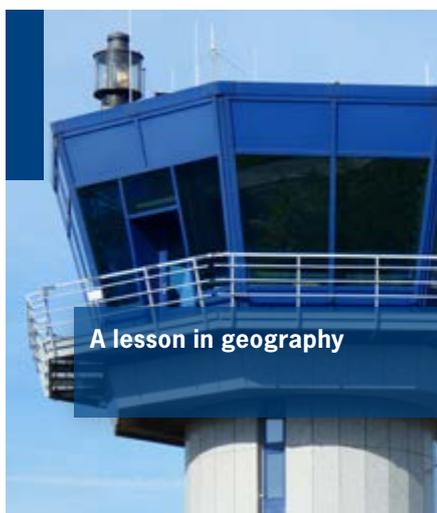


Prof Klaus-Dieter Scheurle,
Chief Executive Officer of DFS



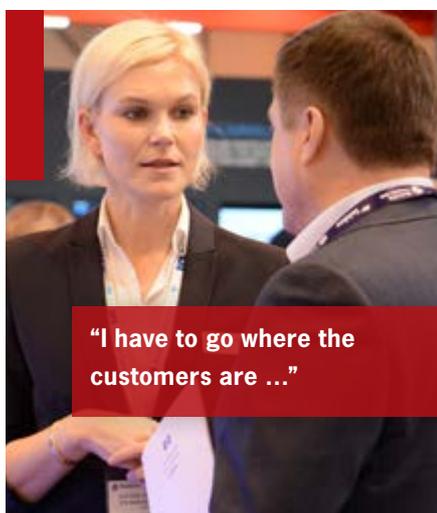
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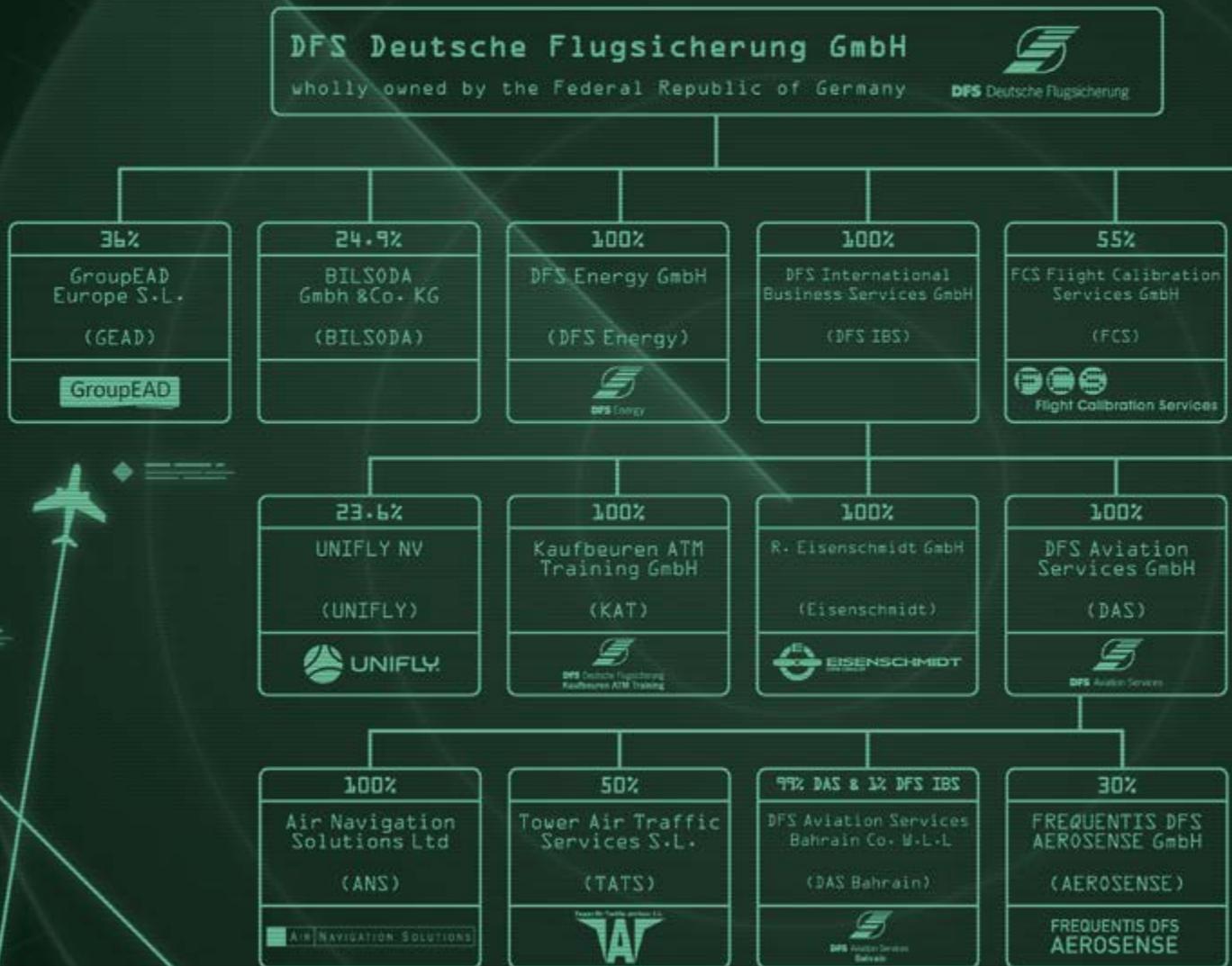
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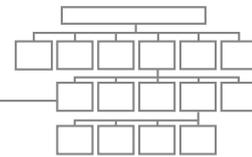
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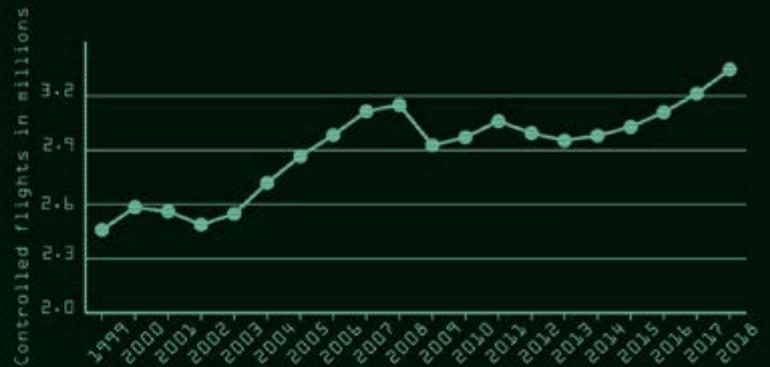
DFS and its subsidiaries

DFS is active in many business areas through its subsidiaries and investments – from flight calibrations in Europe (FCS), air navigation services at London Gatwick and Edinburgh in the United Kingdom (ANS) to our newest business (Droniq). Droniq is a joint venture with Deutsche Telekom, the German telecommunications company, that is developing a technical platform for the detection of drones.





Long-term traffic trend



Top three airports where the DFS Group operates

Frankfurt



Munich



London Gatwick



DFS Aviation Services is the commercial arm of the DFS Group. It markets ANS products and services around the world. In addition, it provides air traffic services at regional German airports in Germany and is also responsible for the provision of air traffic control at Edinburgh and London Gatwick. The map shows the location of a selection of completed and ongoing projects.

51%

Droniq GmbH
(Droniq)

16.667%

European Satellite Services
Provider Société
par Actions Simplifiée
(ESSP SAS)



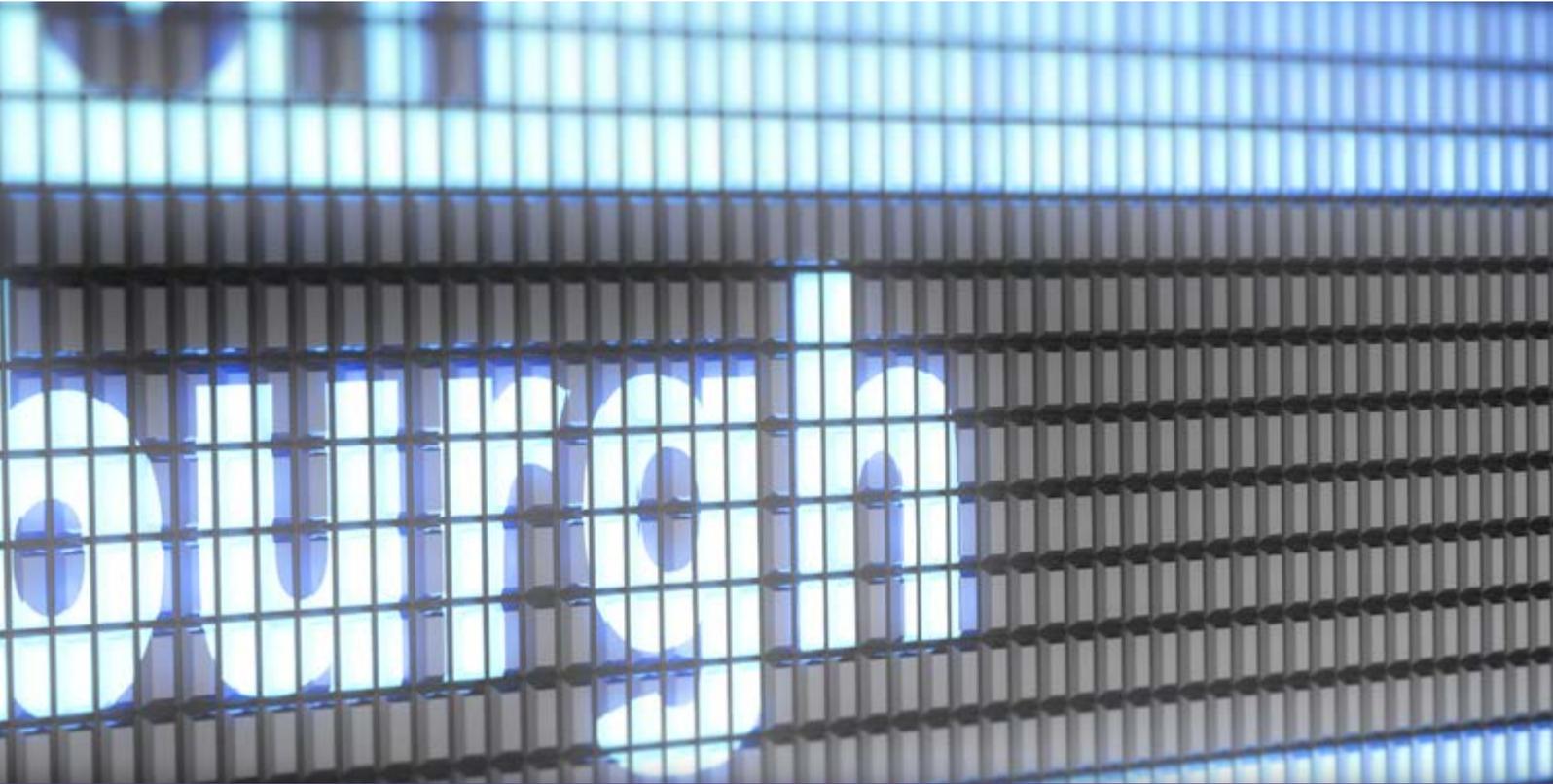
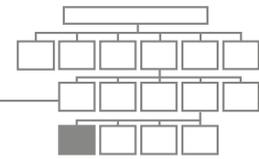
Where Scotland meets the world

If the weather allows it, the approach to Edinburgh is a sightseeing tour in itself. Aircraft typically come from the south over the uplands of Northumberland in the north of England, cross the Scottish border and then bypass the Scottish capital and the airport at first. This is because the final approach to the runway is usually from the northeast. Aircraft must first fly out into the Firth of Forth, the estuary where several rivers, including the River Forth, meet the North Sea. Edinburgh is located on the Firth of Forth's southern shore.

A sharp turn left onto final approach reveals the coastal town of Dalgety Bay on the opposite shore and three bridges lined up one behind the other that connect both sides of the River Forth. Each bridge represents a different century. The first one that comes into view is the Forth Bridge, which opened in 1890, then the Forth Road Bridge, opened in 1964, and finally the Queensferry Crossing, opened in 2017.

After landing, the sightseeing tour comes to a somewhat abrupt end as

the airport is surrounded by low hills that block the wider view of the area. The airport itself is typical of its kind. The control tower, however, is in a different league. This award-winning sculptural landmark rises 57 metres above the airport. Its silver colour and the honeycomb pattern of the cladding make it the visual symbol of the airport. The honeycomb pattern comes from the 9,216 zinc plates that cover the structure. The iconic building also shines brightly at night, lit up by huge eleven-kilowatt floodlights located around the



Edinburgh Airport has what it takes to become a gateway to the world – an international route network, ambitious plans for the future and an award-winning control tower. And air navigation services at the airport are provided by the DFS subsidiary **Air Navigation Solutions** (ANS).

base. There are 12 colours to choose from depending on the occasion – red for the Scottish national day, for example, or blue when the Scottish Rugby Team plays in their national stadium.

130 flight movements per day

The tower is owned by Edinburgh Airport Ltd, the operator of the airport. The tower houses air traffic controllers, system technicians and the admin staff

of Air Navigation Solutions that sit in Edinburgh. Sandy Legget, General Manager for Air Navigation Solutions at Edinburgh Airport, has his office in the base of the tower. Up in the tower cab, air traffic controllers guide the traffic at the airport from the aircraft stands to take-off and from landing to the terminal. The air traffic controllers at their radar screens in the control centre on the ground floor guide the traffic on fixed routes to and from the airport.

 *Edinburgh is the busiest airport in Scotland*

“Edinburgh Airport – Where Scotland meets the world” is the airport’s slogan. The claim is a clear one. Edinburgh is supposed to be the focal point for international flights in Scotland. It is the busiest of the three largest airports in



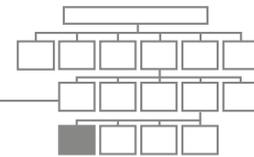
State of the art: The control tower at Edinburgh Airport can be lit up in 12 different colours.



Divided responsibilities: On the left, approach and departure control and, on the right, ground control.
Photos: Sven Chamberlain (DFS)

Scotland, with an average of 330 flight movements per day, followed by Glasgow to the west and Aberdeen to the north. Just under 40 airlines serve destinations across the world. "In summer, American Airlines flies to five destinations in the United States from here," reports Legget. Emirates and Qatar Airlines fly to Dubai and Doha and then on to numerous destinations right around the world. Edinburgh also has a direct link to Beijing, with other routes to Asia also planned. The number of passengers reached a record high of 14 million in 2018. 15 million passengers are forecast for 2019. "The rising number of passengers is primarily facilitated by wide-body aircraft such as the Airbus A350 and the Boeing 787," said Legget. It would be much too difficult for the airport to handle aircraft such as the A380 so it is the high-capacity smaller jet aircraft that are driving the rise in passenger numbers.

"The growth in passengers is also due to the fact that the aircraft on short-haul flights are getting larger," said Legget.



movements is set to double by 2040. To create more aircraft stands for parking, the operator has closed the second runway at the airport, which had only been used for exceptional cases. Three new terminal piers are to be built by 2040, with the first scheduled for in 2022. Within 20 years, airport capacity is set to expand so that the number of aircraft the airport can base will rise from 55 to 94.

“ The weather poses a big challenge

poses a big challenge, for example,” explains Legget. “Visibility is often very restricted.” Fog frequently moves in from the River Forth. The growth plans of the airport operator pose numerous challenges for Legget and his team. “We have to keep pace with growth and maintain the safety standard.” Safety comes first and is of paramount importance. Legget can draw on the experience of DFS and on the successes achieved by Air Navigation Solutions at Gatwick Airport, which handles 950 flight per day from a single runway

— Sven Chamberlain —

An Airbus A320 might be replaced with a slightly larger A321 as demand rises, for instance. The airport operator is expecting growth of one million passengers per year on average thanks to the rising number of aircraft carrying a larger number of passengers on each flight.

The majority owner of the airport, Global Infrastructure Partners, has big plans for the future. The number of flight

Sandy Legget and the tower team are already planning for this rise in traffic. The training of new tower controllers is in full swing. “ANS is sending three groups of six trainee controllers to Germany each year to get their basic training at the DFS Academy in Langen,” said Legget. “Some will be destined to work at Gatwick, some at Edinburgh, and the first group just got back.” Initial practical training then takes place in the tower simulator on site. This piece of high tech is a UFA system which has been up and running in the Edinburgh tower since September 2018. It enables the trainees to learn about the unique features of air traffic in Edinburgh. “The weather

About the person

Sandy Legget started his career at Edinburgh Airport as an air navigation services engineer in 1989. This was followed by jobs in Whiteley, where he headed the airspace development programme, and Prestwick Area Control Centre, as operational manager. In 2013, he returned to Edinburgh to become General Manager of air navigation services. In 2017, he moved from the UK air navigation service provider NATS to the DFS subsidiary Air Navigation Solutions when it took over air navigation services at Edinburgh Airport. He grew up locally. He is married and has a daughter, a son and two step daughters.

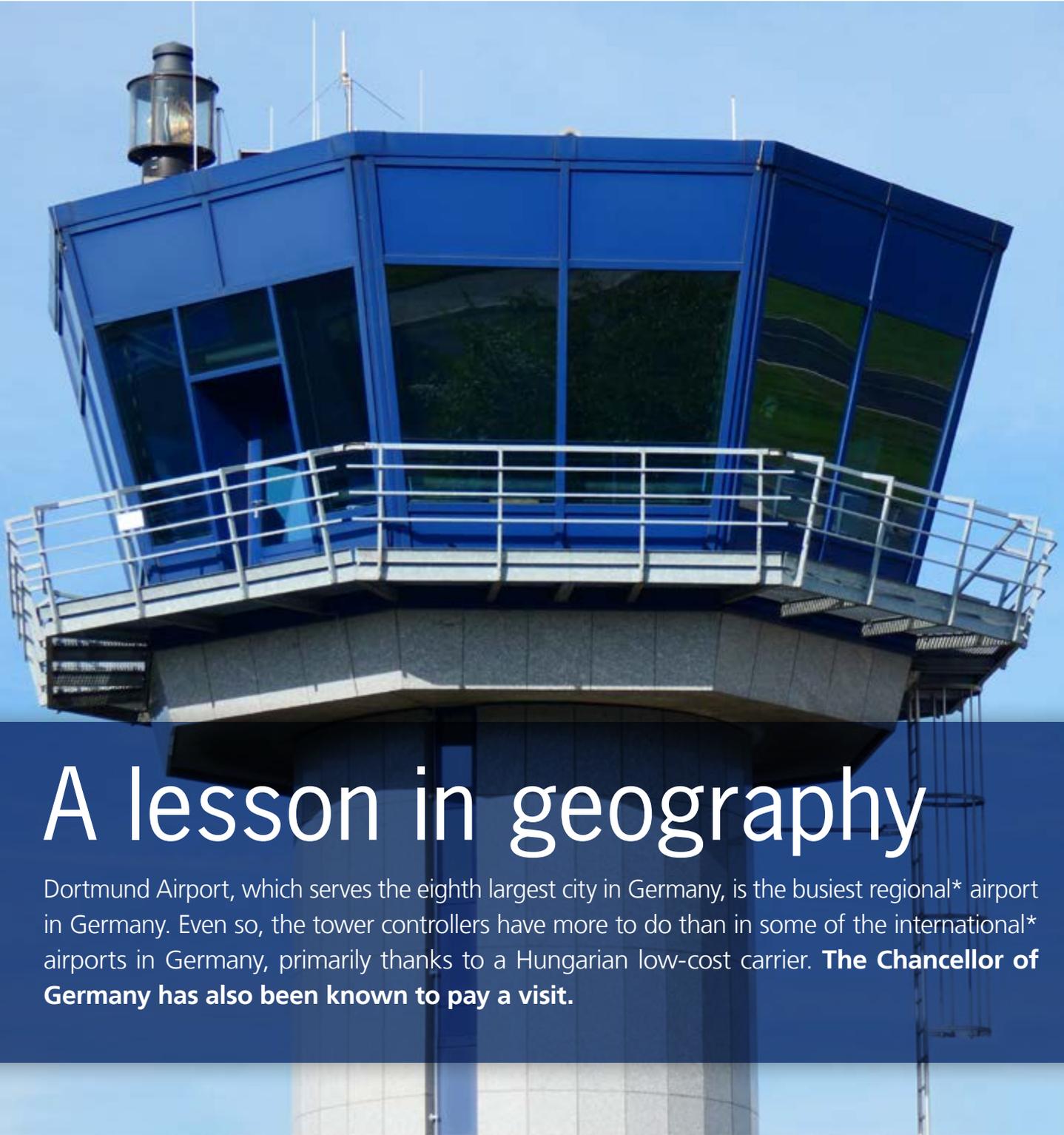
Air Navigation Solutions Ltd

The Old Control Tower
Old Control Tower Road
Gatwick Airport
West Sussex
RH6 OLD
United Kingdom

Phone: +44 (0)1293 226980
admin@airnavigationsolutions.co.uk
www.airnavigationsolutions.co.uk



Sandy Legget, General Manager for Air Navigation Services in Edinburgh.
Photo: Hans-Jürgen Koch (DFS)



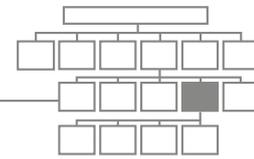
A lesson in geography

Dortmund Airport, which serves the eighth largest city in Germany, is the busiest regional* airport in Germany. Even so, the tower controllers have more to do than in some of the international* airports in Germany, primarily thanks to a Hungarian low-cost carrier. **The Chancellor of Germany has also been known to pay a visit.**

It's Monday morning at Dortmund Airport and things are very busy indeed. An Airbus from Georgia has just landed and the next aircraft are raring to go: four A320s heading for Katowice and Gdańsk in Poland, Kiev in Ukraine, and Budapest in Hungary. As soon as the

inbound plane has cleared the runway, Laura Wolf issues the take-off clearance to the next aircraft: "Wizz Air 6406, wind 090 degrees, 5 knots, runway 06, cleared for take-off." "Cleared for take-off, goodbye," comes the readback.

Laura Wolf and her colleague Stefan Stahl have their hands full. From the tower, they stare down on a sea of purple, pink and white. These are the colours of Wizz Air, the main customer at the airport.



The Hungarian low-cost airline carries out around two thirds of the scheduled flights at the airport and specialises in destinations in Eastern Europe. “If you are not familiar with the region, you’ll need a map to find some of the destinations,” says Stefan Stahl. It’s not as if our air traffic controller training covered the fact that Olsztyn is a city in Poland or that Cluj-Napoca is the unofficial capital of the historical province of Transylvania in modern Romania. Ryanair, easyjet, Eurowings and SunExpress also serve the airport. Last year, there were around 25,500 commercial flight movements in Dortmund – more than at any other regional airport in Germany. With 2.3 million passengers per year, passenger numbers exceed those at some of the 16 designated international airports in Germany, where DFS itself controls the air traffic.

The careers of Laura Wolf und Stefan Stahl as air traffic controllers (ATCO) began at DFS. The path of their careers was not as rigidly straight as it is for others. Laura Wolf was originally meant to work at one of the four large control centres operated by DFS, from where controllers monitor the whole of German airspace. The on-the-job training showed her that a different path would be better. The air traffic around Stuttgart – with its multitude of climbing, descending and crossing aircraft blipping across the radar screen – was not for her. “That’s why I applied for the job here in Dortmund in 2007,” remembers the 35-year-old. Here, she works for the DFS subsidiary DFS Aviation Services, which controls the air traffic at nine regional airports in Germany.

 *There is always something going on here. And the people I work with are cool.*

Her colleague had a similar curving path. Originally, he was to be deployed to the tower at Düsseldorf Airport. But Stefan Stahl took an even more roundabout route, moving to Sylt Airport, serving the popular holiday island in the North Sea off the German mainland, as a position became vacant. “But there was only traffic at the weekends,” recalls Stahl. In the winter, there was nothing at all to do. On his free days, feeling slightly bored, he headed over to the city of Flensburg on the mainland. That is where he met his girlfriend – further proof that the roundabout route is often more productive than a straight one. In 2018, Stefan Stahl switched to Dortmund. A good choice

according to the 27-year-old. “There is always something going on here. And the people I work with are cool.” What is more, for the work in the tower it makes no difference if the final destinations are close by like Belgrade or Sofia and not half a world away.

The airport fire-fighting service has to be on scene in three minutes

In the tower, the morning rush hour is over. A vehicle from the airport fire-fighting services speeds along the runway – such patrol runs take place daily to disperse any birds that have settled near the runway – using a scare cartridge fired from an alarm pistol, if necessary. No sooner have the fire fighters returned to the terminal than Laura Wolf sends them out again by setting off a practice alarm. In the scenario, the landing gear of an A320 has given way on touching down on the 2,000 metre runway. Such exercises are routine. The fire-fighting service has to prove that it is ready to go within three minutes – even at a smaller airport with fewer incidents. A few minutes later, two fire engines and two support vehicles set off with their lights flashing and their sirens blaring. A fifth vehicle is at the scene shortly thereafter. Test passed – in just two minutes.

Pulling a night shift for ambulance flights

Steps echo in the stairway. It is shortly before eleven and the new shift is arriving. Stefan Stahl, who has been sitting here since five, has an hour break. Time enough for a walk or a jog. It’s just enough time for an eight kilometre circuit around the airport and there is a shower on the ground floor. There are four shifts of around nine hours, including breaks. The late shift, which starts at 14:00 hrs, is slightly shorter,

Regional airports:

In Germany, there are 16 international airports and numerous regional ones.

International airports in Germany are designated as such by German law. The German Federal Ministry of Transport has assigned DFS with the responsibility to control take-offs and landings at these airports. Regional airports in Germany, on the other hand, can either take on this task themselves or delegate it to another body.

DFS Aviation Services, a subsidiary of DFS, won the contract for Dortmund Airport.

DFS Aviation Services provides air navigation services at eight other regional airports in Germany, including some of the biggest, such as Paderborn, Memmingen, Karlsruhe and Friedrichshafen.

The Austrian air navigation service provider Austro Control currently provides services at Hahn Airport and eight other somewhat smaller regional airports in Germany.



ATCOs Laura Wolf and Stefan Stahl in the tower at Dortmund Airport. Each year, there are 25,500 commercial flights and 8,000 general aviation flights.

as airport operations end at 22:00 hrs. However, there are exceptions: If flights are delayed, the airlines can apply to be allowed to take off or land after this time.

There are also ambulance flights that can use the airport outside the normal hours. This could be to transport organ transplants from hospital to hospital, for example. Back in February, Stefan Stahl spent the whole night in the tower as the take-off and landing of an ambulance flight kept getting postponed. "I finished work just as the early shift arrived," he recalls and heads off for his break. "Such shifts are voluntary of course," adds the air traffic controller Oliver Strack, who just took over the position. "But who is going to say no?"

Oliver Strack's path to becoming an air traffic controller was not straight either. He trained to work in the rescue services, then studied biology and planned aquariums for zoos: "the big ones, not the goldfish league". Finally, he did his training to become an air traffic controller

at DFS and started at Dortmund Airport in 2005. Now, the 41-year-old is sitting in front of his instruments displaying the next planned flights, the air traffic around the airport and the wind direction – and has to acknowledge an irritating signal tone again and again. Technicians are in the middle of checking a system of contact loops on the taxiways that automatically trigger an alarm when aircraft inadvertently cross them.

The German Chancellor makes her connection

The day sees an unusual guest. A helicopter of the German Federal Border Police touches down and shortly after a Global 5000 from the German Bundeswehr's Special Air Mission. On board is the German Chancellor Angela Merkel heading for an appointment in Wuppertal, a city of around 350,000 inhabitants famous for its suspension railway. As the city has no airport, she is travelling the last stretch of her journey

by helicopter. She takes off towards Wuppertal around four.

After the brief visit from the Chancellor, Oliver Strack takes his break. As he comes back, Laura Wolf's shift is over. She now has to fight her way through the rush hour traffic to where she lives in Cologne, 100 kilometres away. Stefan Stahl has it much easier. He lives really close to the airport. Meanwhile, the late shift, Eugen Kliewer, has arrived. Three years ago, he moved the 350 kilometres from Zweibrücken to Dortmund – around an hour from the town where he grew up. "Privately, it was a stroke of luck," says the 37-year-old, looking over the runway to the horizon. "It's more fun to work at an airport where there is more going on."

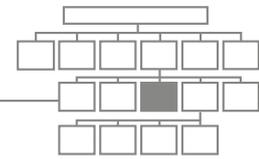
Power plants painted red by the setting sun

Eugen Kliewer will be in the tower until 22:00 hrs – and even longer if there is an emergency – at first with another colleague and then on his own. The airport is lit in the afternoon sun. On the horizon between Dortmund and Unna, a city about nine kilometres away, cooling towers and puffing smokestacks reach for the sky. "I don't think any other airport affords such views of so many power plants," he says. "Some days, the sun rises above one power plant and sinks under another."

— Christopher Belz —

DFS Aviation Services GmbH
Heinrich-Hertz-Str. 26
63225 Langen
Germany

Phone: +49 (0)6103 3748 101
E-mail: info@dfs-as.aero
Internet: www.dfs-as.aero



The number one for private pilots

R. Eisenschmidt is the first point of contact for private pilots in Germany. The DFS subsidiary, located at Frankfurt Egelsbach Airport, a stone's throw from the DFS Headquarters in Langen, near Frankfurt, has undergone a wave of modernisation over the past few years.

Anyone in Germany who is considering getting a private pilot's licence (PPL) will end up sooner or later at R. Eisenschmidt. The PPL question catalogue from the DFS subsidiary is considered the standard reference work for any student pilot and essential reading. It is packed with over 3,000 questions as well as charts that are regularly updated over the year. The digital catalogue covers the licensing standards of almost all the German Federal States and helps student pilots to learn flexibly and independently. "We developed the catalogue with the German Aero Club, DFS and the German Meteorological Service," says Jan-Eric Putze, Managing Director of R. Eisenschmidt from 2016 to May 2019.

When DFS bought the company six years ago, Putze became Company Officer and Achim Eckermann Managing Director. At this time, R. Eisenschmidt was a small distributor of aeronautical products, which still did its bookkeeping by hand. From the beginning, the management team of Eckermann and Putze had an ambitious goal: make R. Eisenschmidt the first point of contact for general aviation in Germany. Their goal was achieved. "The company is a completely different one compared to what there was six years ago," says Ina-Katharina Coutandin. The former air traffic controller previously managed the German Aeronautical Publication Agency at DFS for many years. She has been Managing Director at R. Eisenschmidt since March 2019. She shared the management of R. Eisenschmidt with Jan-Eric Putze for the first two and a half months and has been solely responsible at the top of the company since May.

The R. Eisenschmidt team with their boss Ina-Katharina Coutandin (front row, third from right).





Peter Boneto (left) and Julia Müller with aeronautical maps and charts in printed and digital form. Pictures: Melanie Bauer

Germany's largest map dealer

The company roots stretch back to the distant past. When Rudolf Eisenschmidt founded a publishing house in Berlin in 1880, the German Chancellor was Otto von Bismarck. Only a few years later in 1887, the company started a wholesale and retail business for maps. By the time the Second World War started, it had become the largest German map dealer and was the main distributor for all official maps for the German national mapping agency, the Reichsamt für Landesaufnahme.

The connection between the company and general aviation began in September 1909 when the first chart for airships made its debut at the first International Airship Exhibition in Frankfurt. This chart was the forerunner of today's aeronautical charts. The creator of the chart, a lieutenant-colonel called Modebeck, had already had a publishing house in mind – the firm Rudolf Eisenschmidt – that would market the maps to the whole world. Another first came in 1928. Eisenschmidt published the first aeronautical information publication for Germany, which included approach charts for aerodromes.

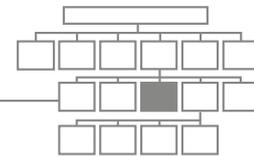
When DFS bought the company in 2013, it was like a meeting of old acquaintances. In 1961, the then German Federal Administration of Air Navigation Services had selected it to be the sales unit for its official publications for pilots. The partnership ended after four decades as new rules demanded that the contract be put out to tender across Europe and another company won the tender. When this company encountered economic problems, DFS had to look for another partner. It was by lucky chance that the long-time owner of R. Eisenschmidt was looking to sell at the same time. Jan-Eric Putze pushed DFS to seize the chance.

“Since then, we have controlled the distribution of our official aeronautical publications ourselves,” says the 46-year-old Putze, who combines business and aviation expertise. After starting off in a bank and then completing a banking degree, he worked for Deutsche Bank for several years. Putze also holds a commercial pilot's licence, flies business jets as a side job and works as a flight instructor. In May, he became the Managing Director of Droniq, a new joint venture between DFS and Deutsche Telekom.

“We brought our expertise in producing the aeronautical information publication and aeronautical maps and charts, and Eisenschmidt had the outlet for accessories for VFR pilots,” says Putze. “We've turned the company 180 degrees around, given it a new image and set a completely new direction.” Today, R. Eisenschmidt functions as a pilot shop, aeronautical publisher and point of contact for general aviation in one. Our portfolio of aeronautical products covers around 4,000 items – from official aeronautical publications and training material to technical accessories for the preparation, planning and conduct of flights.



Jan-Eric Putze was the Managing Director of R. Eisenschmidt for six years.



The company headquarters remains the same – a flat-topped building with a slightly larger extension at Egelsbach Airport. The interior of the building has been completely renovated. The pilot shop as you enter the building was redesigned, as were the bright modern offices at the back. Thirteen members of staff and the Managing Director now work here. Before DFS acquired the company, there had been only three.

“Eckermann, Putze and their team modernised all the business processes,” says Ina-Katharina Coutandin as she leads the way through the company. The warehouse and space for shipping is housed in the extension beside the pilot shop and offices. The newly updated charts have just arrived and are stacked based on geographical region on a long sideboard against the wall and are being readied for shipping. The next AIRAC date is in two days and the charts need to be with their customers by then.

The bookkeeping and other processes are no longer done by hand. Customers can order the products they want using their iPhone and get a shipping confirmation in the same way.

Incoming invoices are scanned automatically. The system recognises the contents and suggests how the invoice should be booked. “This makes our work

much easier,” says Coutandin. “Eckermann and Putze made the company fit for the future, both as regards the products as well as the back-office functions and data protection.” Achim Eckermann, Managing Director of the DFS subsidiary from 2013 to the end of 2015, and also a private pilot, recalls the years of hard work: “Working as a team, we set a new direction for the company, created a compelling proposition for general aviation customers and successfully integrated the company into the DFS Group,” said Eckermann, who has a degree in aerospace engineering and a degree in business administration.

The pilot shop

The two pillars that make up the core business are aviation training for manned aviation and the pilot shop. If required, R. Eisenschmidt also provides risk assessment and advice and submits applications to the aeronautical authorities of the German Federal States – Länder (Landesluftfahrtbehörden). There are cooperation agreements with the German Ultra-light Aircraft Association, the German Aero Club and Aviationexam, the leading European learning platform. “Aviationexam is our direct cooperation partner for exam software,” says Coutandin. Each year in spring, R. Eisenschmidt is present at the AERO in Friedrichshafen, the international trade exhibition for general aviation, where



Ina-Katharina Coutandin, Managing Director since March 2019.

they have direct contact with pilots and manufacturers of business jets and light aircraft and where they experience the newest trends and developments.

This has all paid off. Last year, R. Eisenschmidt generated revenue of EUR 4.5 million and earned a profit of around one million euro. The outgoing Managing Director Jan-Eric Putze is very happy with the result and has handed over a successful and well-run company to his successor. “What has already been achieved sets the bar for the successes we want to achieve in the future,” says Ina-Katharina Coutandin. “Standing still is not acceptable.”

— Holger Matthies —



R. Eisenschmidt GmbH

Flugplatz 1
63329 Egelsbach
Germany

Phone: +49 (0)6103 20596 0
customer-support@eisenschmidt.aero
www.eisenschmidt.aero

Unerringly exact

“In the next few days, calibration flights will be conducted at ...”

In 2018, some 25 percent of the press releases DFS put out in Germany contained this line. But what exactly are calibration flights and what is flight inspection? transmission answers the most important questions.



The calibration team of FCS Flight Calibration Services in action. They use the highly sensitive technology on board to check if navigation aids are functioning correctly.

Why are calibration flights carried out?

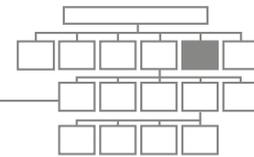
Flight inspection is all about safety. The International Civil Aviation Organisation (ICAO) mandates that the signal precision of navigation aids, radar facilities and direction finders be regularly checked. DFS is bound to adhere to these ICAO provisions as they apply across the globe. DFS also follows ICAO recommended practices as regards the frequency of such inspections. These recommendations are not binding but are viewed as best practice for quality assurance. In many ways, such flight inspections are similar to the roadworthiness tests private cars have to go through in many jurisdictions every few years. Just like with cars, without such regular inspections, air navigation services facilities can lose their technical approval. Military navigation aids are also subject to such checks.

Who is responsible for flight inspections?

In Germany, DFS itself issues the technical approval for the civil facilities that have to be inspected. The German Federal Supervisory Authority for Air Navigation Services (BAF) monitors whether DFS complies with all the requirements involved. One of these requirements is the periodic check of air navigation facilities by means of flight inspections. Calibration flights are carried out on behalf of the flight inspection management unit at DFS by FCS Flight Calibration Services (FCS) – a subsidiary of DFS. The Swiss (skyguide) and Austrian (Austro Control) air navigation service providers also hold stakes in the company, which is headquartered at Braunschweig Wolfsburg Airport, in the German State of Lower Saxony. FCS also carries out flight inspections for these organisations.

What is inspected?

Navigation aids, direction finders as well as ground- and satellite-based navigation aids (such as instrument landing systems). It is essential for flight operations that such facilities operate free of fault. Instrument landing systems (ILS), for instance, which are inspected every six months, enable safe landings even in extremely low-visibility conditions. In a very literal sense, pilots need to be able to rely blindly on such systems. During a calibration flight, the signals sent out by the facilities are checked to see if they are strong enough and can be received without interference. Problems may arise with the range or the signals might deviate from the correct flight path. The approach and departure procedures are also checked – not just the signals. The crew of the calibration aircraft also checks the flyability of the planned procedure, the obstacle



clearance and whether the procedures are published correctly in the aeronautical maps and charts.

How does flight inspection work?

Calibration aircraft are equipped with sensitive measurement devices. An extremely precise GPS receiver determines the exact position of the aircraft. On board, the crew normally consists of two pilots and one flight inspection engineer. While one pilot concentrates on flying, the flight validation pilot checks whether the flight procedures comply with the requirements. The engineer is responsible for recording and evaluating all of the technical parameters of the navigation aid. The measurements are normally within the tolerances as the system managers responsible for the facilities check for irregularities during regular maintenance checks. Problems are usually discovered at an early stage and any deviations corrected before they exceed the tolerances.

Why did DFS set up a subsidiary for flight inspection?

The predecessor organisation to DFS, the German Federal Administration of Air Navigation Services (BFS), had built up these capabilities from its foundation

in 1953. In parallel, the German military, supported by the Allied Forces, set up their own flight inspection capabilities. Civil and military flight inspections were brought together in 1976 in the Joint Flight Inspection Unit (GFMS). As air navigation services in Germany were corporatised, DFS decided to spin off its flight inspection into a company of its own. The intention was to cooperate with a private company. Flight Inspection International (FII) was founded in 1997, with stakes being held by a company called Aerodata and the Austrian and Swiss air navigation service providers. After the cooperation with Aerodata ended, FCS Flight Calibration Services was set up in its present form. Bundling such activities in a joint subsidiary means customers' demands can be met optimally and productivity can be boosted by sharing resources across several countries.

What aircraft are used?

FCS Flight Calibration Services has two Beechcraft King Air 350 turboprops. The equipment is supplied by specialist companies and mounted in the aircraft. It takes many months to equip and then certify such equipment. The company uses faster aircraft (Learjet 35A) to inspect radar facilities. Each calibration flight requires various flight manoeuvres and normally takes several hours.

FCS Flight Calibration Services

- **Foundation:** 2001 as a joint venture between DFS, Austro Control and Skyguide
- **Headquarters:** Braunschweig
- **Managing Director:** Christian de la Roi
- **Staff:** 35 permanent staff plus freelancers

FCS Flight Calibration Services GmbH

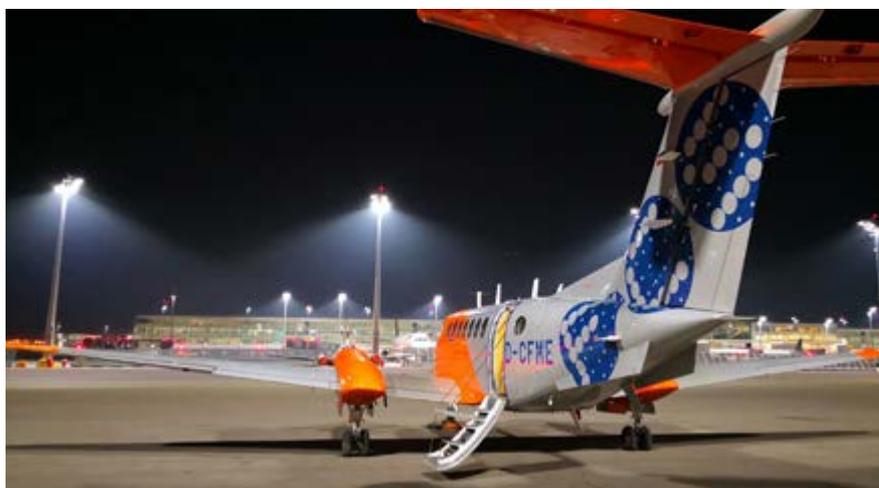
Hermann-Blenk-Str. 32 A
38108 Braunschweig
Germany

Phone: +49 (0)531 23777 0
E-mail: info@fcs.aero
Internet: www.fcs.aero

Could flight inspections also be carried out by drones in the future?

So far, there is no prospective drone that can meet the requirements for calibration flights. Their use is being tested, of course. Drones have been placed on extendable telescopic masts, for example, to see if they could be used for inspections. However, technical and legal conditions will have to be met before they will be seen in use to ensure that the safety of flight operations is not put in peril.

— Sandra Ciupka —



Packed full of high tech: a Beechcraft King Air 350 operated by FCS.



The previous KAT Managing Director Joachim Keck (2nd from left) hands over a symbolic key for the new campus to the new Operational Director Jan Herchenröder (right). The picture also shows DFS CEO Klaus-Dieter Scheurle (2nd from right) and Otto Fischer, Director of the DFS Air Navigation Services Academy (far left).

Start-up mentality

Two years ago, Kaufbeuren ATM Training (KAT), a subsidiary of DFS, took over the training of military air traffic controllers for the German Armed Forces, the Bundeswehr. A new modern training centre was built directly beside the barrack grounds.

The German town of Kaufbeuren is the perfect place to set up a training organisation: The local ice hockey club, ESV Kaufbeuren, is known for its work with young players and is widely regarded as a talent factory for the German top-tier ice hockey league – although it only plays in the second division at present. Many players in the German national team, such as Didi Hegen, Stefan Ustorf and Sebastian Furchner, earned their spurs there. Somewhat less well known but just as successful in nurturing new talent is Kaufbeuren ATM Training. The focus here is not on future sports stars but on military air traffic controllers and AIS officers. At the beginning of 2017, KAT officially took over responsibility for the training of military air traffic services

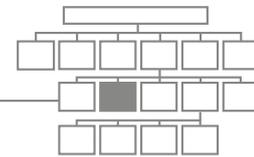
personnel from the Bundeswehr, the German Armed Forces. It was only a short three quarters of a year before that when DFS signed the contract with the German Federal Office of Bundeswehr Equipment, Information Technology and In-service Support, and then set up its new subsidiary in April 2016.

Previously, the Germany military had trained its air traffic controllers in Kaufbeuren itself. During a reform of the Armed Forces, the German Ministry of Defence decided to close the Kaufbeuren air base and was considering the transfer of the operational training of air traffic controllers to another site. Local politicians protested and started the search for a civilian partner – which they found in DFS. “The decision of DFS

to choose Bavaria as a good place to locate was a great day for us,” says Stefan Bosse, the Mayor of Kaufbeuren.

Speed dating

“In the years before, the only way the Bundeswehr could maintain its training capacity was by pulling people from other units and transferring them to Kaufbeuren to act as instructors,” says Jan Herchenröder. “That soon became a personnel problem.” The 45-year-old has been the Operational Director of KAT in Kaufbeuren since May. He spent 23 years with the Bundeswehr and knows military air traffic control inside and out. He has practical experience as an air traffic controller at various military aerodromes



and headed the air traffic services and support squadron in Mazar-i-Sharif when he was stationed in Afghanistan. He was also an instructor and head of air traffic controller training in Kaufbeuren. In 2016, he moved from the Bundeswehr to KAT just after it was formed, where he took over the responsibility for the ATC training and simulation business unit. Since May, he has controlled the destiny of KAT as the Operational Director.

Prior to that, Joachim Keck was the Managing Director at the head of the DFS subsidiary. He retired at the end of April after 43 years in air navigation services. He remembers how KAT started – the price negotiations conducted in tropical temperatures in an office container on the Lahnstein barracks, the recruitment campaign for instructors using a speed-dating format because only a few months were available between the founding of KAT and taking over the responsibility for training. He remembers signing contracts as if they arrived by conveyor belt. “We set up KAT with a start-up mentality,” says Keck. When transmission visited the subsidiary three years ago shortly after it was set up on the air base, the office of the Managing Director did not even have an internet connection. A sticky note on the door gave the only clue to who worked there.

Ambition

The difficult conditions at the start spurred the KAT staff to greater heights. At the end of 2016, the preparations for the installation of the new simulation system

began as the old simulators were being broken apart. Only two months later, it was ready in time as responsibility for training transferred to KAT. Two brand new radar simulators and a tower simulator could now be used for training. The simulators employ a rear-projection system that uses 16 laser-phosphor projectors to cast images onto mirrors that reflect them onto acrylic screens. Every image is razor sharp and rich in contrast.

At the same time, construction work began on the new training campus at the beginning of 2017. It had been made clear from the beginning that the DFS subsidiary was only a temporary guest on the barrack grounds. DFS has invested a low double-digit million euro amount in acquiring the site, renovating two residence halls and building a new training centre directly beside the barracks. Around a million euro was spent on the new simulator technology and a six-figure sum on a modern IT network.

The interior of the residence halls was refurbished, the outside clad in wood and the building re-roofed. Two sober-looking functional buildings have become real architectural gems. The three-story training building sits in a 2,400 square metres plot. It houses the new simulators, the offices and the canteen for around 100 people. This building is clad in perforated aluminium sheets, which would stretch to 7,000 metres if laid end to end.

Tablets, not paper

The outside work on the training centre was completed at the beginning of July. The new simulation system is being set up in the building. Training is set to begin in October. “We’ll be training 30 trainee air traffic controllers a year,” says Jan Herchenröder. The theory module lasts three and a half months and the practical training six and a half months.

Course material is only provided on tablet computers, with no paper involved. KAT acquired 80 Windows tablets for this purpose. The course material on the devices is regularly updated over the wireless network in the training building. In the future, the tablets in the ATC domain will be equipped with the same simulation software that runs on the tower and radar simulators. Trainees will be able to practise their exercise runs after office hours.

Herchenröder is not worried about a lack of trainees. “Lots of military air traffic controllers will be retiring in the coming years. The Bundeswehr will have to push ahead with the training of new controllers.” KAT will have a lot to do.

— Holger Matthies —

Kaufbeuren ATM Training GmbH
 Fliegerhorst Kaufbeuren
 Apfeltranger Str. 15
 87600 Kaufbeuren
 Germany

Phone: +49 (0)8341 99 775 0
 E-mail: info@kat.aero
 Internet: www.kat.aero

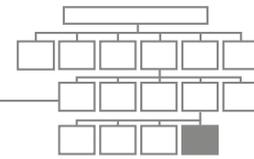


The newly constructed training building on the KAT training campus in Kaufbeuren. Photos: Mathias Wild (2)



“I have to go where
the customers are ...”

FREQUENTIS DFS AEROSENSE is a joint venture between the DFS subsidiary **DFS Aviation Services** and **Frequentis**. The company is a way for both organisations to bundle their technical and operational expertise to offer turnkey remote tower solutions.



In Leipzig in the east of Germany, you can already see the technology of the future in action today. DFS has set up its Remote Tower Control (RTC) Centre in Leipzig, the most populous city in Saxony. From there, it controls the traffic at Saarbrücken Airport, 450 kilometres to the west. From Leipzig, DFS air traffic controllers keep a close eye on traffic at Saarbrücken Airport without needing to look out of the tower cab. A combination of video and infrared cameras deliver a permanent 360-degree view of the airport. In concrete terms, aerodrome control is no longer carried out by controllers on site. Instead, controllers are located far away and use technology that replaces the view from the tower.

“Currently, Saarbrücken Airport is the largest airport in the world that is controlled remotely – both in terms of flight movements and passenger numbers,” says Katrin Scheidgen, Managing Director of FREQUENTIS DFS AEROSENSE.

A young company

FREQUENTIS DFS AEROSENSE is a joint venture between the Austrian technology company Frequentis and the DFS subsidiary DFS Aviation Services. Frequentis holds 70 percent of the company and DFS Aviation Services 30 percent. Each company supplies one Managing Director – Katrin Scheidgen represents DFS Aviation Services while Christian Weiss represents Frequentis.

FREQUENTIS DFS AEROSENSE is a young company, having been formally set up in Vienna in November 2018. The groundwork for the company had been laid eight months before in Madrid by Frequentis and DFS. In March 2018, the two companies signed the agreement at the World ATM Congress in the city to set up the joint venture. The objective was



The camera at Saarbrücken Airport supplies images to the RTC Centre hundreds of kilometres away in Leipzig. Photo: Christopher Belz (DFS)

to combine the technical and operational expertise of the two companies to produce and market turnkey remote tower solutions.

The Madrid agreement stemmed from the successful work on a remote tower project to monitor Saarbrücken Airport from Leipzig. Frequentis supplied the technical system while DFS implemented the operational part of the project. “The knowledge we both gained from this project now forms the basis to be able to jointly market remote tower technology internationally,” says Scheidgen.

Bundled solutions

In addition to her work for the joint venture, her primary responsibility is as Head of Business Development at DFS Aviation Services. This DFS subsidiary came into being in 2017 when the Aeronautical Solutions division of DFS and the DFS subsidiary The Tower Company were joined to take over the commercial business of the entire DFS Group. Scheidgen also played a leading role in this project.

“FREQUENTIS DFS AEROSENSE can fall back on the resources and structures of

both parent companies when acting on the international stage,” explains Scheidgen about the underlying business model of the joint venture. Customers get a bundled solution, which optimally matches the system supplied by Frequentis with the operational expertise and experience of the DFS Group. Customers save time and resources when setting up their own RTC system.

 *We are taking part in a number of international tenders*

The company is currently working on concrete proposals and offers for several interested parties from around the world. “We are taking part in a number of international tenders,” explains Scheidgen. “When doing so, we are combining our operational presence in the regions, our reputations and naturally our expertise.”



From the RTC working position in Leipzig, controllers monitor the traffic at Saarbrücken Airport. Photo: BILDSCHÖN

Customers get more than the system. They get comprehensive advice on all important operational questions. How do you draw up a business plan for an RTC project? What detailed issues need to be borne in mind when evaluating the systems? What is the best way to organise air traffic controller training? How do you draw up an operational concept? What do you need to consider to get the system ready for regulatory approval? What is the best way to design the change management process, an essential component of any RTC project? Which stakeholders need to be brought on board and when?



Katrin Scheidgen, Managing Director of FREQUENTIS DFS AEROSENSE.
Photo: Melanie Bauer

Scheidgen generally speaks about remote tower solutions and not remote tower technology: "Frequentis supplies the system and manages the technical implementation. We supply the operational expertise. We advise air navigation service providers on how they can best implement a system change with RTC from an operational perspective that best fits their needs."

Air traffic controllers, shareholders, trade unions, regulatory authorities – they all need to be involved fully in such a process from an early stage and be convinced of its necessity.

There was great interest in RTC at the latest World ATM Congress and Scheidgen and her colleagues had many conversations with representatives of air navigation service providers from around the world. "Our RTC project for Leipzig Saarbrücken got us a lot of attention and recognition in the industry internationally," says Scheidgen.

Many balls in the air

RTC has changed how Katrin Scheidgen organises her day. At DFS Aviation Services she has a more strategic focus, at Aerosense the stress

is squarely on sales. "Now I have to go where the customers are and explain why they should buy RTC solutions from AEROSENSE." Her greatest challenge at the moment is bringing together her duties at both companies in such a way that they all profit. Finding this balance is like juggling with multiple balls. "I never know what the day brings. That's what makes the job so exciting."

— Holger Matthies —

Katrin Scheidgen

Katrin Scheidgen is one of the two Managing Directors of FREQUENTIS DFS AEROSENSE. She comes from Bersenbrück, near Osnabrück in Lower Saxony in the north of Germany. She studied business administration in Cologne. After graduation, she worked for Koelnmesse GmbH, one of Germany's largest trade fair organisers, before moving to DFS in 2008 where her last position was in the Corporate Development division. In 2016, she was involved in founding DFS Aviation Services, where she now manages the Business Development unit. Since November 2018, she has held both positions, retaining her position at DFS Aviation Services while simultaneously being responsible for FREQUENTIS DFS AEROSENSE. She has a six-year-old son and plays golf in her spare time to relax.

FREQUENTIS DFS AEROSENSE GmbH

Innovationsstrasse 1
1100 Vienna
Austria

Phone: +43 1 81150

E-mail: office@aerosense.solutions

Internet: www.aerosense.solutions

DFS and Deutsche Telekom set up Droniq

DFS and Deutsche Telekom launch a new company called Droniq. This joint venture provides the technical platform to enable the economic operation of drones.

How can the safety of drone flights be ensured without the drones remaining within sight of the pilot? How can drone flights be made without causing conflicts with manned aircraft?

DFS and Deutsche Telekom have found a solution to these questions. Together, they have developed a technology that uses the mobile communications network to track unmanned aircraft systems (UAS), commonly known as drones. This puts in place one of the central preconditions to be able to safely operate drones across larger distances, and not just in close vicinity to the pilot. Delivering this precondition is a necessary step for the economic operation of unmanned aircraft systems.

The core of the product offering is a UAS Traffic Management System (UTM). This system processes the position data of drones and displays them together with the tracking data of manned aircraft. In this way, a complete air situation display is created. The UTM system also offers additional functions for the safe operation of drones in German airspace, including registration, mission planning and an automated process for obtaining any permissions required for a particular drone flight. "We are introducing the first UTM system operational in Germany to integrate drones safely and fairly into airspace," said Klaus-Dieter Scheurle, CEO of DFS.

At first, Droniq will focus on the German market, the home market for DFS and Deutsche Telekom. Then, a phased expansion across Europe is planned. The primary markets being focused on are 1) commercial operators in the infrastructure, surveying and agricultural sectors which intend on flying drones beyond the visual line of sight, 2) the emergency services, such as the police, fire and rescue services, and 3) general aviation users. Training courses for drone operators and individual consultancy services are already part of Droniq's portfolio

— Editorial staff —

Droniq GmbH

Ginnheimer Stadtweg 88
60431 Frankfurt/Main
Germany

Phone: +49 (0)69 509547 400
E-mail: info@droniq.de
Internet: www.droniq.de



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Published by

DFS Deutsche Flugsicherung GmbH
Christian Hoppe
Director Corporate Communications

Editorial staff

Sandra Ciupka (editor-in-chief)
Tel.: +49 (0)6103 707-4122
E-mail: sandra.ciupka@dfs.de

Christopher Belz
Tel.: +49 (0)6103 707-4121
E-mail: christopher.belz@dfs.de

Holger Matthies
Tel.: +49 (0)6103 707-4124
E-mail: holger.matthies@dfs.de

Sven Chamberlain
Tel.: +49 (0)6103 707-4114
E-mail: sven.chamberlain@dfs.de

Rüdiger Mandry (final copy editing)
Tel.: +49 (0)6103 707-4195
E-mail: ruediger.mandry@dfs.de

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Contact

DFS Deutsche Flugsicherung GmbH
transmission
Am DFS-Campus 10
63225 Langen
Germany
E-mail: transmission@dfs.de

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