

Special edition – 2018

transmission

The DFS magazine

25 years

DFS looks back at remarkable transformations

Out of sight but safely so

A new system detects and displays drones

The perfect wave

Gatwick tower handles 950 aircraft on a single runway on just one day



New Challenges

DFS celebrates its 25th anniversary and looks forward to the opportunities the future will bring. In 2017, a record high of 3.2 million flights was recorded in Germany.

Dear reader

This year sees DFS celebrate its 25th anniversary. In 1993, the baton was passed from a government agency, the German Federal Administration of Air Navigation Services, to DFS, a company organised under private law. In the quarter century since, DFS has faced the challenge of mastering a surge in air traffic in German airspace. When DFS was established, the air traffic controllers at the company controlled 1.9 million flight movements. In 2017, this had risen to a record high of 3.2 million.

As befits an anniversary year, in this issue of transmission, you can take a look back at our history and a look forward to our future. New challenges have arisen to replace the old. One current challenge is the rise in the use of drones. DFS is currently devoting time, resources and energy to establishing an air traffic management system for unmanned aircraft systems. We have set up a competence centre within the company to work on ensuring the safe and fair integration of drones into airspace. Staff from a range of specialist departments have been brought together in this new department.

Another current challenge where DFS has made substantial progress is in the area of remote tower control (RTC). In this issue of transmission, you can read more about the advances made in our RTC project. This year will see DFS controlling traffic at Saarbrücken Airport in the far west of Germany from its Remote Tower Centre in Leipzig, hundreds of kilometres away to the north-east. The airports in Erfurt and Dresden will follow. RTC offers the potential of providing air traffic services at airports with low traffic more efficiently while still maintaining the high safety level our industry demands.

The last quarter century has also seen DFS develop from a national to an international company. A DFS subsidiary, DFS Aviation Services, offers consulting services around the globe, while another subsidiary, Air Navigation Solutions Ltd, has provided air navigation services at London's Gatwick Airport since 2016. In April 2018, Air Navigation Solutions Ltd will take over aerodrome and approach control at Edinburgh

Airport, too. Gatwick Airport experienced record traffic in 2017. In this issue of transmission, we will look at how staff at ANS are handling this enormous number of flights with only a single runway.

Our successes were the result of hard work and good choices. They were the result of our committed and highly qualified employees. And they were the result of picking the right technology at the right time. Just recently, for example, we had the successful introduction of the air traffic control system iCAS. The system is now in operation for upper airspace and will be phased in at our control centres for lower airspace over time. We look forward to the next 25 years and the opportunities and challenges they will bring.

I hope you enjoy reading our magazine.



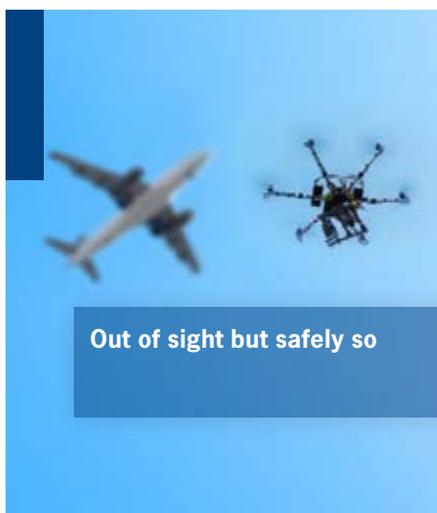
[Prof. Klaus-Dieter Scheurle](#)
Chief Executive Officer of DFS



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Anniversary

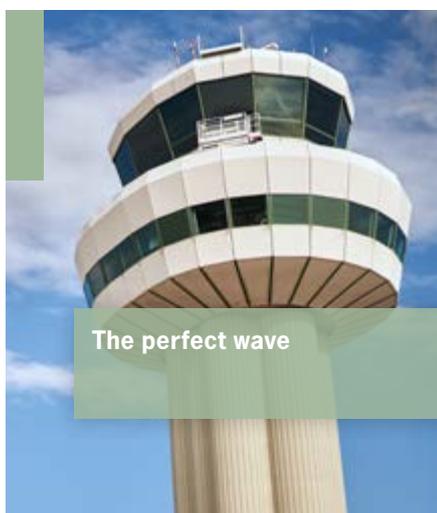
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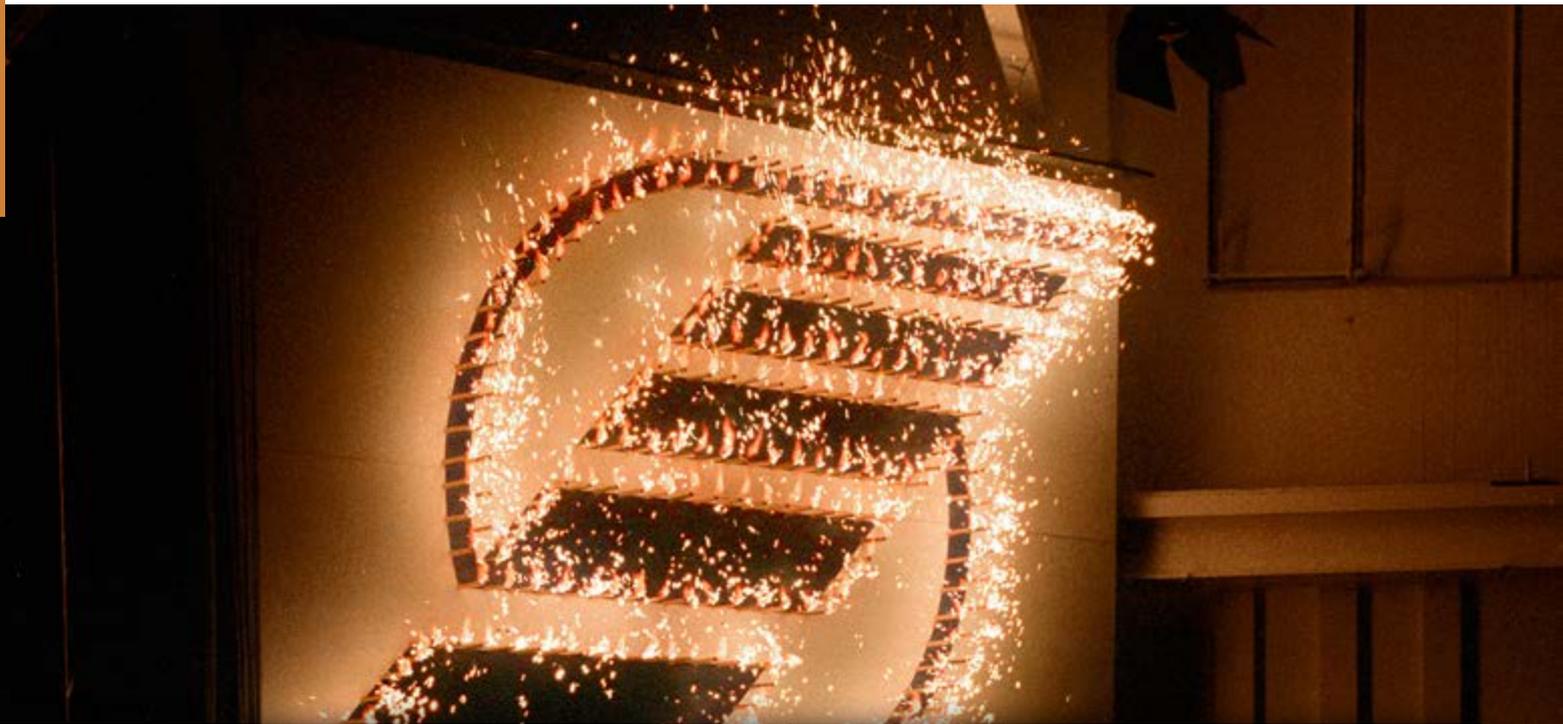
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25 years of DFS

It has been an eventful 25 years since DFS Deutsche Flugsicherung GmbH was founded. German airspace has undergone a remarkable transformation due to many factors, including the growing volume of air traffic. DFS has also transformed itself into one of the world's leading air navigation service providers.

DFS was officially founded in October 1992 as a private limited company. On the night of 1 January 1993, DFS officially took over operations from the Federal Administration of Air Navigation Services (BFS), a government agency. Air traffic control in the Federal Republic of Germany had been provided by BFS for 40 years.

It is the job of DFS to ensure the safe, orderly and expeditious handling of air traffic in Germany. DFS operates four control centres, in Langen, Bremen, Karlsruhe

and Munich, as well as control towers at the 16 designated international airports in Germany. Around 2,500 air traffic controllers are currently employed at DFS. To keep pace with traffic growth in the upcoming years, 120 new air traffic controllers will begin their training this year at the DFS Academy, the in-house training facility of the company. In addition to air traffic controllers, DFS employs around 3,000 employees in technical and administrative departments.

More than five billion passengers have flown safely through German airspace over the past 25 years – one of the most complex airspaces in the world. With over 3.2 million IFR flights controlled, 2017 was a record year. This is the largest number of aircraft movements ever recorded in one year in the history of German air navigation services.

The following pages feature highlights from the last 25 years in pictures.

The years 1993 to 2000 at a glance



Civil-military integration

When DFS was founded, regional military air traffic control was integrated into what is a non-military company. Except for the traffic at military aerodromes, military air traffic is controlled by DFS. Previously, military training airspace was reserved for tactical flight exercises and off limits to civil aircraft. Today, these airspaces are only closed when military training exercises are actually taking place. Otherwise, they can also be used by civil aircraft. Germany's civil-military cooperation is unique and exemplary in Europe today.

1993

Two million flights

"We used to think more than a million flights wouldn't be possible," recalls the former air traffic controller and long-serving DFS spokesman Axel Raab. He still remembers the day in the mid-1980s when DFS reached the one-million-flight threshold for the first time. Although it seemed as if the capacity limit had been reached, in 1995, a new record was set. DFS controlled two million IFR flights in one year thanks to new developments in technology and revamped processes.



1995



New control centre in Langen

In 1999, the Frankfurt control centre moved to a modern new building on the campus in Langen, south of Frankfurt. The new control centre also featured a new air traffic control system called P1/ATCAS. In subsequent years, the control centres in Düsseldorf and Berlin were closed down. Their control sectors were distributed between the control centres in Langen, Karlsruhe and Bremen.

1999

IATA Eagle Award

The International Air Transport Association (IATA) honoured DFS as the world's leading air navigation service provider with the Eagle Award 2000. Every year, the Eagle Award is presented to airports or air navigation service providers for special achievements and ongoing development.



2000



2002 to 2016



New corporate headquarters

In 2002, DFS completed construction of its new corporate headquarters in Langen. DFS employees left their old offices in Offenbach, east of Frankfurt, on a Friday and moved into their new offices in a modern glass building on the DFS campus in Langen the following Monday.



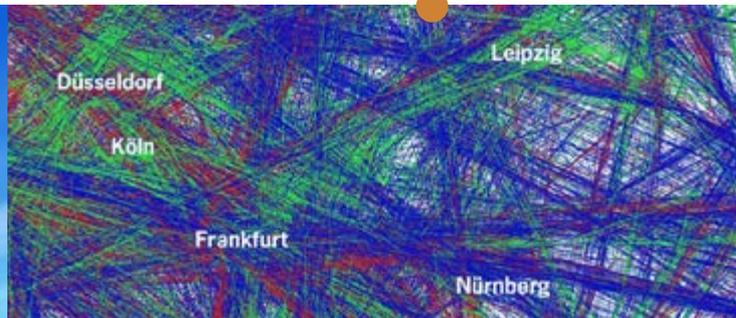
A new DFS subsidiary for regional airports

DFS established its subsidiary, The Tower Company, to offer air navigation services at regional airports. This was in response to the German legislator deciding to allow competition at smaller airports. Dortmund Airport was the first of many of the busiest regional airports to choose this new subsidiary to provide its services. In the meantime, DFS has reorganised its commercial business. Now, what used to be The Tower Company is part of the DFS subsidiary, DFS Aviation Services, which was founded in 2017.



Single European Sky

With Regulation No 549/2004, the EU Commission laid the foundation for the Single European Sky, known as SES. The SES initiative established a series of regulations that have had a major impact on DFS. For example, the regulations call for all European air traffic control systems to be harmonised. Another major change was that national supervisory authorities had to be established to monitor the air navigation service providers. In addition, a performance plan with targets for safety, capacity, environment and cost-efficiency was defined.



Three million flights

For the first time in German airspace, more than three million flights under instrument flight rules were counted in one year. The picture shows the flight paths of around 10,000 aircraft over Germany on one day in 2007.



A new Board of Managing Directors

In 2013, Klaus-Dieter Scheurle (centre) assumed the position of Chairman and Chief Executive Officer of DFS. He replaced Dieter Kaden who retired after 20 years of service. Robert Schickling (left) became Managing Director Operations and Dr Michael Hann (right) Managing Director Human Resources and Labour Director.



Technology conference on drones

DFS intends to play an active role in the future of drones. In 2015, DFS – in cooperation with Lufthansa Aerial Services and Fraport, the operator of Frankfurt Airport – tested the use of a remotely piloted camera drone. In the following year, DFS started a joint project with Deutsche Telekom. The goal is to develop a traffic management system for unmanned aircraft. The drone's position data are transmitted via the mobile telecommunications network and displayed on an air situation display using a tracker developed by DFS. The photo shows DFS CEO Klaus-Dieter Scheurle at the technology conference on drones organised by DFS.

2013

2016

2015

2016



Remote Tower Control

The DFS remote tower control project was launched at Saarbrücken Airport, in the west of Germany near France. The objective is to control traffic at smaller airports from a centralised remote location. Swivelling cameras and infrared sensors supply air traffic controllers with the information they need. As soon as the system is ready for implementation, control of air traffic at Saarbrücken, Erfurt and Dresden airports will be gradually transferred to the central Remote Tower Centre in Leipzig, in the east of Germany.



DFS subsidiary takes over air navigation services at London Gatwick

DFS and its UK subsidiary, Air Navigation Solutions, took over the provision of air navigation services at London Gatwick Airport, the second largest airport in the UK. With up to 950 take-offs and landings per day, it is the busiest airport in the world with only one runway. From April 2018, Air Navigation Solutions will also be responsible for tower and approach control at Edinburgh Airport. At both airports, the previous service provider was the UK air navigation service provider NATS.



2016 to 2018

2016



New training centre for military air traffic controllers

On 1 January 2017, the DFS subsidiary Kaufbeuren ATM Training GmbH (KAT) took over military air traffic control training in Kaufbeuren in cooperation with the Bundeswehr. KAT is investing EUR 18 million to build a new training centre and residence halls for military air traffic control personnel. In addition, the analogue devices used in the past are being replaced by modern, digital simulators. KAT has also introduced a new tower simulator that features a sophisticated rear-projection system with a resolution of more than 36 million pixels.

2017

New subsidiary for commercial business

With the foundation of DFS Aviation Services, DFS consolidated the sale of services and products related to air navigation services in one company. Its air traffic controllers today control air traffic at nine regional airports in Germany, about 60 percent of all regional air traffic in Germany. The new subsidiary also markets air navigation services technology. DFS Aviation Services is headquartered in Langen, with representative offices in Singapore and Beijing.



DFS Aviation Services

2017



DFS launches new air traffic control system

DFS introduced the new iCAS air traffic control system at its Karlsruhe branch, which controls the upper airspace of Germany. It is faster and more powerful than its predecessor and is backed by a modern technical platform. Over the next few years, DFS will gradually install iCAS at its control centres for lower airspace in Munich, Bremen and Langen. DFS is currently working on adapting the system to lower airspace. The aim is to use iCAS as a standardised air traffic control system in the future. iCAS is part of the joint European project iTEC (interoperability Through European Collaboration).

2018

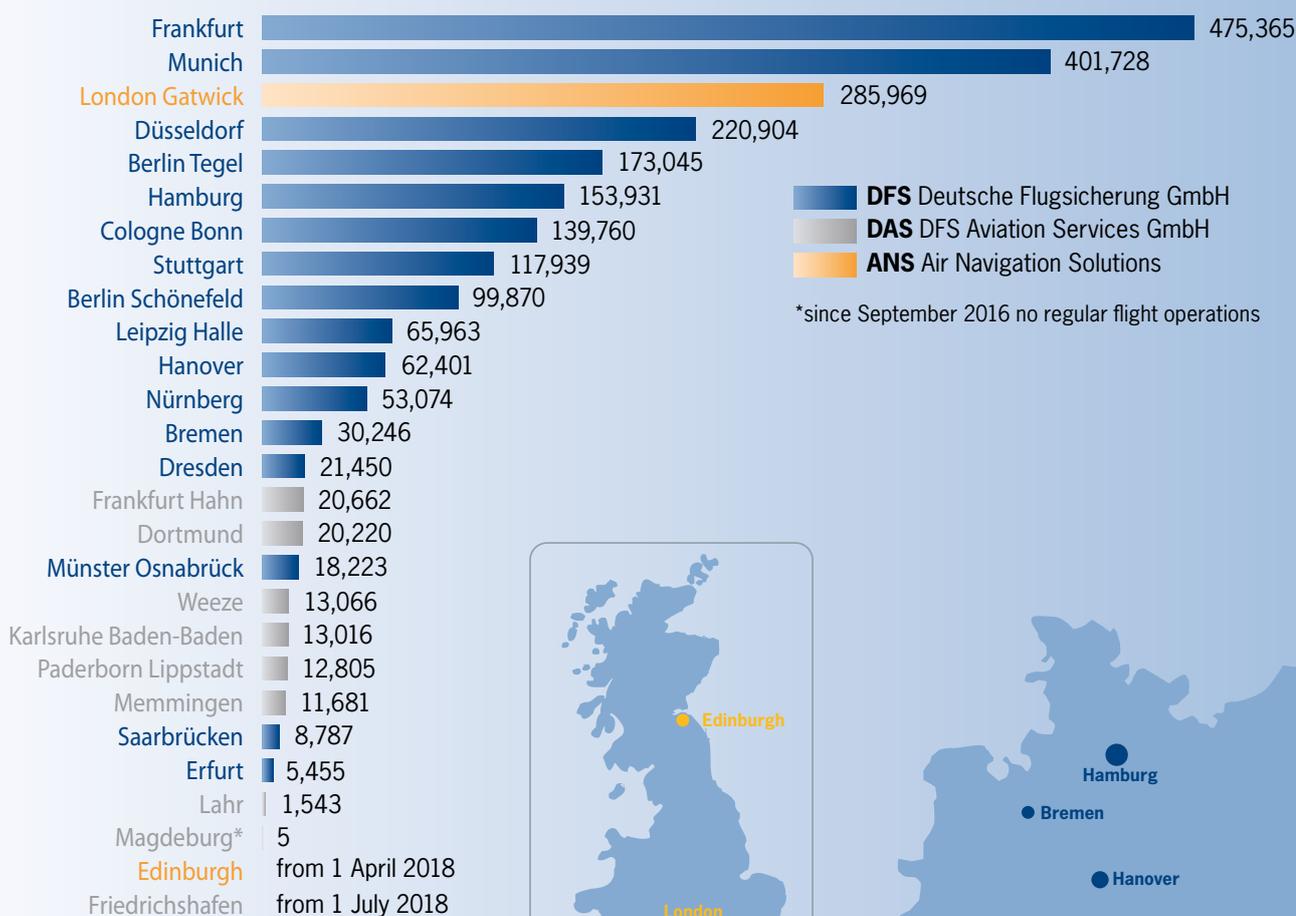
New traffic record

In 2017, more than 3.2 million IFR flights were recorded in German airspace. That is almost as many as the company controlled in its first two years combined. In addition, 2017 was the safest year in the history of civil aviation in the world. DFS made a major contribution to this. Since its foundation 25 years ago, DFS has guided more than 67 million flights safely through German airspace.



25 years of safety, 25 airports

IFR flights in 2017



The volume of air traffic has increased dramatically since DFS was founded. In 1993, DFS controlled 1.8 million flights. In the meantime, this figure has nearly doubled. In 2017, over 3.2 million flights were recorded in German airspace – more than ever before. DFS is not only responsible for en-route control in Germany, but also – together with its subsidiaries DFS Aviation Services and Air Navigation Solutions – for the control of arrivals and departures at a total of 25 airports in Germany and the UK. In 2018, it will also take over control of Friedrichshafen Airport in the south of Germany and Edinburgh Airport in Scotland.

A 25-year balancing act

A quarter century of mutual trust: **The foundation of DFS was also the beginning of civil-military cooperation in Germany.**



How can we balance the use of the scarce resource of airspace to equally serve military and civil users? For DFS and its part-

ners and customers, this question comes up every day. DFS is responsible for handling both civil and regional military air traffic in peacetime. Civil-military cooperation means that the sky is not divided rigidly into military and civil airspace. Instead, the airspace is used as required. DFS is regarded as a pioneer of the flexible use of airspace (FUA). Germany was instrumental in developing this European concept and efficiently implemented FUA before all others.

Armed Forces (Bundeswehr) are scheduled to use a TRA, they announce whether and when training flights are to take place. During these times, the TRAs are generally closed to civil air traffic. The use of TRAs is coordinated by the Airspace Management Cell (AMC). This organisational unit is made up of DFS employees and members of the Bundeswehr. If a military training

is the job of the Civil-Military Cooperation Committee. This committee is made up of representatives from the German Federal Ministries of Defence and Transport. The committee is chaired by Osman Saafan, Director Corporate Safety and Security Management and Military Affairs at DFS. The German Military Aviation Authority plays an advisory role.

The committee looks at questions on airspace coordination and other aspects of civil-military cooperation relevant to air traffic control.

Three permanent steering groups support the committee. Among other things, these groups continuously develop and improve civil-military cooperation. They decide on new military airspace, discuss procedures and work on future concepts, such as Free Route Airspace. In addition, they coordinate Germany's position on international projects.

“One of my division's most important tasks is to create and develop a basis of trust between DFS and the Bundeswehr,” said Osman Saafan. “This can only succeed if we keep an eye on all interests and ensure transparent and fair dealings on various topics and with each other.” Saafan is himself the best example of the close link between civil and military air traffic control. He is a colonel who has been released from regular service to work for DFS. Besides DFS, he has also held important positions with the German Air Force and the Ministry of Defence.

airspace is not or only partially in use, it can be opened for civil flights.

That is the principle. However, what sounds simple in theory, is a permanent balancing act in practice. “Ultimately, it always comes down to a compromise, to an optimised balance between military and civil airspace management,” said Petra Allhoff, a long-serving airspace manager at DFS.

Strategic cooperation is crucial

Civil-military cooperation at the strategic level is a prerequisite for achieving this balance at the tactical and pre-tactical levels. Whatever the AMC implements has to be worked out beforehand. This

The FUA principle is straightforward – at least in terms of its use in everyday operations, meaning the pre-tactical and tactical levels. Temporary restricted areas (TRA) are set up as defined dimensions of airspace in which flights are restricted under specified conditions. One day before the flying units of the German

ners and customers, this question comes up every day. DFS is responsible for handling both civil and regional military air traffic in peacetime. Civil-military cooperation means that the sky is not divided rigidly into military and civil airspace. Instead, the airspace is used as required. DFS is regarded as a pioneer of the flexible use of airspace (FUA). Germany was instrumental in developing this European concept and efficiently implemented FUA before all others.

His work as a broker between civil and military interests was even honoured by Defence Minister Ursula von der Leyen with the Silver Cross of Honour, one of the German military's decorations of honour.

The other members of the DFS Corporate Civil-Military Affairs team also know the Bundeswehr from within. The head of the Military Competence Centre at DFS, Thomas Klein, is a lieutenant colonel released from regular service and transferred to DFS. He has many years of experience in the field of air traffic control. His team is made up of soldiers also released from regular service including a former Tornado pilot whose added benefit is that he understands the perspective out of the fighter jet cockpit. "My department is an important constant in the field of civil-military cooperation, as we generally stay in our functions longer than most of our military partners," said Thomas Klein. He is also responsible for regular consultations with military customers and complaint management. There is even a complaint telephone hotline where military pilots can contact DFS directly.

"To complement our knowledge of the duties and organisation of the services, my colleagues and I also work on keeping good personal contacts at all levels to facilitate cooperation," explained Osman

Saafan. "It makes cooperation faster, more efficient and less bureaucratic." A European comparison shows that close cooperation between air navigation service providers (ANSP) and the military is not a matter of course. "Many European ANSPs have a far more distanced relationship with their military than we do."

An important consequence of this trust-based cooperation is the continued development of FUA. In addition to the TRAs, variable profile areas (VPA) were introduced in 2013. VPAs are split up into smaller units of airspace that can be temporarily closed off. Depending on their requirements, the military may use more or less of these units. This means that, under certain conditions, civil air traffic can be routed through a VPA, even though military flights are taking place there. So far, DFS is the only ANSP in Europe to have implemented this idea.

Additional ideas for the future are already being worked on. One such project is the development of dynamic mobile areas for the unmanned aerial vehicle Global Hawk. Instead of placing restrictions on a fixed airspace, this concept creates a roaming restricted airspace that moves along with the military aircraft. Global Hawk would be surrounded by a

Civil-military cooperation

Committee on civil-military cooperation

Airspace management and fundamental issues of airspace structure and airspace use.

These steering groups provide assistance to the committee:

- **Airspace coordination steering group**

Major focus: Further development of FUA, airspace design and procedures.

- **Communications, navigation and surveillance (CNS) and air traffic management (ATM) systems steering group**

Major focus: Joint use of air traffic control infrastructure and interoperability between DFS systems and systems of the armed forces.

- **Cooperation MetAIMDat steering group**

Major focus: Cooperation in the field of aeronautical and meteorological data and space weather.

"bubble" of restricted airspace during its entire flight.

It is still unclear whether such a concept will ever be implemented. "Nevertheless, the example of the dynamic mobile area shows how important it is to constantly develop new ideas so that the scarce airspace over Germany can be optimally used," said Saafan.

— Sandra Ciupka —



Dynamic mobile areas would be used for unmanned aerial vehicles like the Global Hawk.



Out of sight but safely so

Up until now, drone pilots in Germany have been legally compelled to keep their aircraft in sight. **Safe drone flights over longer distances will be possible using a new system developed by DFS that detects their position and displays them on an air situation display.** This new system uses the tried-and-trusted architecture of existing DFS technology.

Drones can be used in various ways: to inspect power lines, deliver urgent packages or take aerial film shots. Drones can even save lives. In an accident, they can provide information from the scene to the rescue services or even search for victims. A field test in October 2017 near Hamburg was an impressive demonstra-

tion of this. A child had disappeared in dense reeds on the banks of a river. A drone equipped with a thermal imaging camera started the search and transmitted image and position data to the rescue teams from the German Life-saving Society (DLRG). When the rescuers arrived on the scene, they knew exactly where to rescue the missing child from

the water. A time advantage that can save lives in an emergency.

A system developed by DFS in cooperation with Deutsche Telekom provided the technical platform. In 2016, the two companies launched a joint research project. The aim of the project is to track unmanned aircraft flying close to



the ground via the mobile communications network and to display their position. The project partners developed an LTE modem that includes a GPS module and a mobile radio transmitter unit. This device, which weighs around 50 grams, is mounted on the drone and transmits the position data to the mobile network. At the same time, DFS set up a system that records the data sent and displays the position of the drone.

Unlike real aircraft, drones can change course at sharp angles

The heart of this system is the Phoenix multi-sensor tracker, which DFS developed at the beginning of the millennium and which has evolved ever since. This tracker takes the signals provided by DFS radar systems from aircraft in German airspace and displays their exact positions on a monitor. DFS expanded and modified the Phoenix tracker, which it uses at all its branches and sells on the international market. “We had to expand the zoom range and make some adjustments,” explained Ralf Heidger, who is in charge of these developments at DFS. “Conventional aircraft fly in airspace that is divided into large sectors. This is why the original system was not designed for small-scale representation.” The system first had to learn that unlike conventional aircraft, drones can also turn around in the air or change course at sharp angles. “The algorithm initially smoothed such angular flight paths into curves. We’ve adjusted that now,” added Heidger.

This time, the position data that the tracker displays does not come from DFS radar systems. Instead, it uses position signals sent by the modems attached to the drones via Deutsche Telekom’s mobile network. DFS has been testing the system extensively since July 2017. The results show that drones equipped with such a



Field test in Hamburg: DFS and Deutsche Telekom demonstrate the advantages of an air traffic management system for drones in cooperation with the German Lifesaving Society.

mobile radio transmitter can be detected up to a height of 100 metres. They are not permitted above this level anyway. The mobile phone network is actually not optimised for this purpose. “However, the waves are reflected off the ground, which is why it can establish a connection to higher heights,” said Heidger.

After initial adjustments were carried out, tracking drones with this system now works well. The tests showed that the drone tracker also accurately displays complex flight paths. It can process the

signals of several hook-on devices and display them as separate targets on an air situation display. Hook-on devices do not necessarily have to be attached to drones. In one experiment, a hook-on device was placed on board a police helicopter – and its movements were also tracked without any problems. “You could equip aircraft such as gliders that don’t have transponders and don’t appear on the radar screens of air traffic control,” said Heidger. “That would be a simple technical way to make VFR traffic in lower airspace visible and safer.”



The drone’s image and position data are transmitted to the emergency response centre. The system is based on the Phoenix multi-sensor tracker – a DFS in-house development.



Information from the drone lets the rescue team know where to look for the missing child.

We use the same configuration for unmanned and manned aircraft

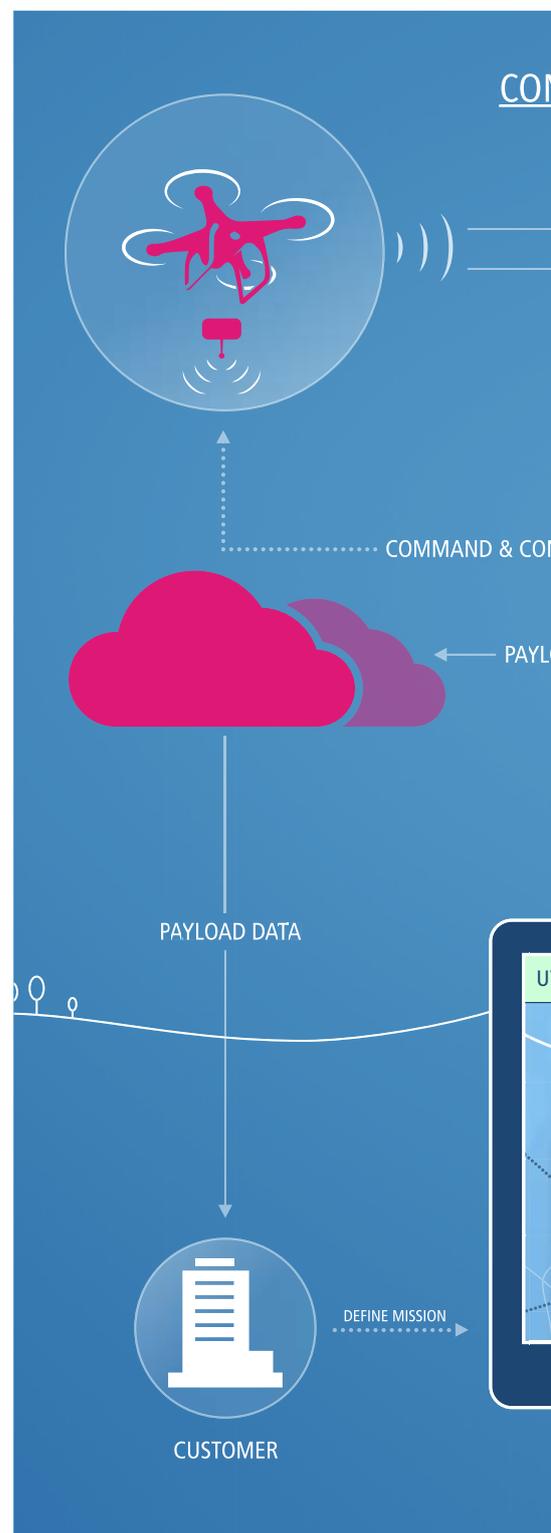
In the different scenarios tested, only so-called swing-wing aircraft caused problems. Unlike multicopters, which are built like miniature helicopters, this type of drone is designed like an aeroplane and can reach high speeds. They pose a problem for the tracker. “Sharp turns can cause a temporary loss of signal. We are still working on a solution,” said Heidger. It is significant that the drone tracker is not specialised in drones only. “We use the same configuration for unmanned and manned aircraft, and we can create a common air situation display.” The optimised tracker was also used for the test near Hamburg conducted by the German Lifesaving Society. The drone used was controlled via the mobile communications network. It transmitted its position data back to the emergency response centre, where it was monitored by the tracker.

DFS is now developing an air traffic management system for drones (UTM) in cooperation with the Belgian manufacturer Unifly. Such a system will not require air traffic controllers. “U” in UTM stands for “unmanned aircraft system”, commonly referred to as drones, and “TM” for “traffic management”. The aim is to control all detected drones in a largely automated manner. The framework for such a UTM system is already in place. The software developed by Unifly was approved after extensive tests in January 2018. “This means that we are now well prepared for the use-case experiments planned for 2018,” explained Thilo Vogt, who heads the DFS UAS/UTM Development & Solutions department.

Such a UTM system would raise the level of safety in uncontrolled airspace and allow unmanned aircraft to be flown over longer distances. “Flights outside the range of sight of the pilot would also be possible without problems,” said Vogt. In addition, the UTM system can be connected to the air traffic control systems and warn tower controllers of possible conflicts. In fact, the most frequent conflicts between manned and unmanned air traffic occur near airports. Of the 88 incidents with drones registered

by DFS between January and December 2017, 70 occurred in the vicinity of an airport.

In addition to displaying the current situation in the air, the UTM system is





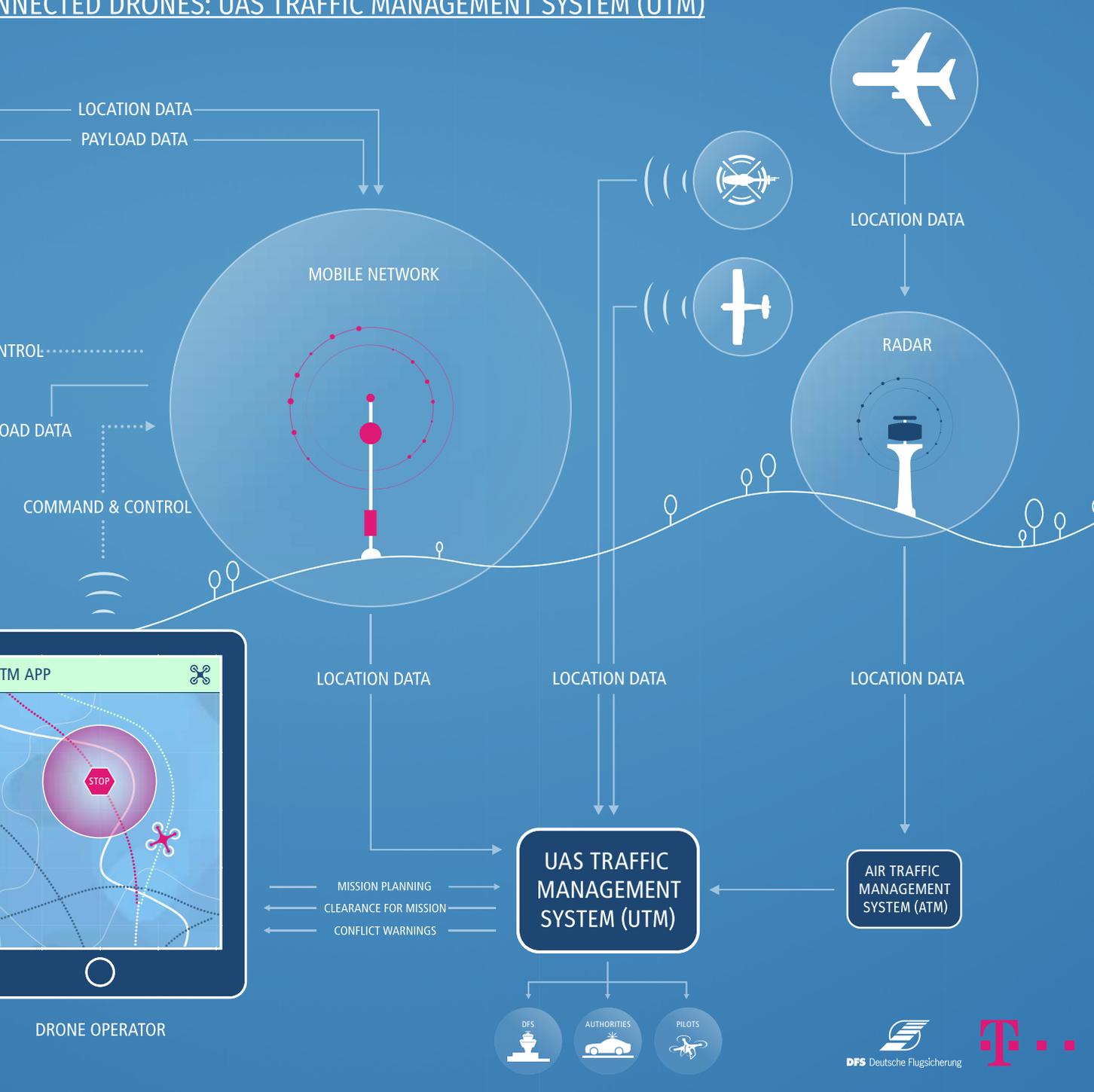
intended to provide drone pilots with further information, for example, on restricted areas and the weather. After DFS updates its drone app that first appeared in July 2017, it has further plans. By next year, there will be a professional

version, which will provide the air situation and additional information. Furthermore, professional users should be able to log into the UTM system via a web interface and plan their flights. According to Vogt, "The Phoenix system has stood the test

of time and will now boost the safety of manned and unmanned air traffic."

— Christopher Belz —

CONNECTED DRONES: UAS TRAFFIC MANAGEMENT SYSTEM (UTM)





Close-up: The controller can use the pan-tilt-zoom camera to zoom in on and track objects of interest.

Remote tower control is no longer so remote

DFS backs remote tower control (RTC). It is by no means alone in doing so. The difference is that DFS, together with Frequentis, has used the expertise and input of DFS air traffic controllers to take a different approach than others.

Picture an airport in your mind. You will probably see terminal buildings, runways and tower-ings above them all, a control tower. This association – that every airport needs a tower – could soon be a thing of the past, however. Working with the Austrian high-tech company, Frequentis, DFS has come up with a solution for remote tower control that will make the towers at the three smallest international airports in Germany

superfluous. In future, air traffic at the airports of Saarbrücken, Erfurt and Dresden will be controlled remotely from a joint RTC centre kilometres away in Leipzig.

Years of experience and development have been just as necessary to achieve this as modern technology. The core of the technology is a sophisticated camera system that not only replaces the view from the tower cab, it improves on it

in some situations. The overall system is made up of three interdependent systems. One element is a 360-degree video camera that shows the controllers a panoramic image of the airport. The second element is a 360-degree infrared camera – especially useful in bad weather or at night. Finally, as the name suggests, a pan-tilt-zoom (PTZ) camera means the controller can zoom in on and track objects of interest as well.



The RTC system, which DFS and Frequentis jointly developed, offers more than a mere replacement of the view from the tower. Controllers have access to additional information and support for their daily work. The system can automatically identify objects and label any flight movements. Both, aircraft taxiing on the ground as well as approaching and departing aircraft in the air can be incorporated into the system, giving controllers the information they need directly at their working position. The trusted air traffic control systems the controller is used to working with are, of course, also available in the RTC centre. “DFS is not the only one to have discovered the opportunities that remote tower control offers,” said Cengiz Özdemir, manager of the project at DFS. “But our system is technically more advanced and more rooted in the real work of controllers than other systems currently on the market.”

“Small is beautiful”

The future users of the system were closely involved in the development. This has made all the difference. One example of such a difference was in the choice of monitors. Thanks to controller input, DFS made the conscious decision against oversized monitors – a feature of other providers. Such enormous monitors look impressive when the images from the panorama camera are projected onto a 360-degree wall of monitors. It really is as if the controllers were actually sitting in a tower cab at the airport. However, real-world trials showed that such a set-up was less than optimal. The controllers involved preferred monitors placed directly at their working position. “Orientation is much faster on such monitors – details are easier to process than on a distant wall of monitors,” explained Özdemir. “We all agreed on one thing: Small is beautiful.”

Years of research lie behind this solution. DFS began examining the possibilities in 2010. At first, DFS set up a research project with the German Aerospace Centre to investigate the basic feasibility of the technology and tease out the role of human factors. In 2015, DFS decided to jointly develop the RTC solution with Frequentis. After a host of trials, validations and improvements, the solution passed the latest test at the end of 2017. Over the course of several weeks of practical trials, the RTC system proved that it could meet the operational demands placed on it. Now, only a few corrections are required before the final implementation can be completed.

The airport will be controlled from Leipzig, hundreds of kilometres away

Saarbrücken Airport, in the west of Germany near the border to France, has been selected as the first site for remote tower control. A camera mast with sensors was erected at the airport in 2017, while hundreds of kilometres away to the north-east in Leipzig, a remote tower centre was equipped with the necessary technology. Training on the new system began at the beginning of 2018. The technical implementation is scheduled for the end of the year. The first aircraft taking off from Saarbrücken Airport will then be controlled by an air traffic controller sitting hundreds of kilometres away in Leipzig. Two more airports will be phased in later – first Erfurt in 2019 and then, following another validation phase during which the remote tower control concept will be reviewed, the much busier Dresden Airport. Dresden is the largest of the three, with more traffic than Saarbrücken and Erfurt combined.

DFS has decided on a single RTC solution for these three airports. A controller at the remote tower centre will always

only be responsible for one airport at any one time. Joint working positions will also be established to issue start-up approvals at all RTC airports. DFS sees numerous



The camera tower at Saarbrücken Airport was erected in 2017.



Protective housing shelters the 360-degree video cameras from wind and weather.

“Remote tower control will provide greater flexibility in staff rostering.”

advantages from this set-up. Staff costs can be reduced and productivity improved. “Controllers will be cross-trained for all three sites, too.” This will provide greater flexibility in staff rostering,” said Alexander Koch who heads the Tower Division at DFS.

Developments in this area are continuing. After the project is completed,

DFS will review if medium-sized airports could be integrated into the remote tower centre, too. It would also be technically possible to have controllers control more than one airport at the same time. This would allow controllers at smaller airports with less traffic to improve their proficiency as well as deliver more cost savings. DFS is currently investigating this multiple RTC approach jointly with

other partners in the European SESAR programme. “This approach could revolutionise how we control air traffic,” said Koch. “But we could only introduce this multiple RTC approach when we are sure that our high safety standard can be maintained.”

— Christopher Belz —



An air traffic controller in the remote tower centre in Leipzig.



DFS to upgrade ground-based nav aids

DFS has decided to renew Germany's VORs and DMEs by the end of 2024. After all, aviation still relies on ground-based navigation, at least for the time being.

Approaching Helgoland

Harsh winds blow grey clouds over Cuxhaven Nordholz Sea Airport, a small but historic airfield on the coast of the North Sea in Germany. The gales buffet the treetops of this flat region north of Bremen. These conditions would not prevent aircraft from taking off at an international hub such as Frankfurt, but things are different in Nordholz. There are no enormous four-engine jets here. Today, there is just a 1960s British light utility aircraft, a Britten-Norman BN-2 Islander that flies for a small local airline, OFD. It is a twin-engine propeller aeroplane for one pilot and eight passengers with a take-off weight of just under three tonnes and a cruising speed of 240 kilometres per hour.

“We need at least 600 feet of visibility,” says the friendly airport check-in agent at the small airport near the shore. So far, it is only 400 feet.

That means no take-offs for now. But, there is still more than an hour until our scheduled departure to Helgoland Island at three in the afternoon. The weather starts to improve and it gradually clears up. Just half an hour before our flight is supposed to leave, the check-in desk announces that we will take off on time. Two of my travelling companions, Thomas Langer und René Wagner, breathe a sigh of relief.

The two air navigation services engineers are familiar with the pitfalls of travelling to work on the island of Helgoland. More than once, their flights with OFD were cancelled because of the weather, most recently last week. “Instead, we had to race to Cuxhaven by car and take the ferry. By the time we got to the island, we were six hours behind schedule,” explains Langer.



The radome and antenna will be mounted onto this steel construction.

Photos: Holger Matthies

New technology

The two system specialists at the DFS Bremen branch often travel to Helgoland, which is located 50 kilometres off the German coast. They are responsible for the maintenance and repair of DFS navigation aids located in a large swathe of Germany that includes the picturesque but remote island of Helgoland. Their recent journeys to this VHF omnidirectional radio range (VOR) on the North Sea island were, however, not for standard maintenance. This VOR facility, which is actually located on the smaller of the two islands belonging to Helgoland, is currently being upgraded



Denis Zrnic, project manager

with new technology. The old facility was dismantled in May last year. “The plant was getting on in years,” says Denis Zrnic of the Building Projects department, who has also accompanied the engineers on this trip.

The Helgoland VOR is not the only one currently being updated. It is part of a DFS project to renew old VOR and DME (distance measuring equipment) stations throughout Germany by the end of 2024. “Some of our VOR/DME facilities are already 30 years old, and most of them have reached the end of their lifecycle”, explains Zrnic, who is responsible for the overall project. “At the end of the day, we want all of our facilities to be more accurate and reliable.”

Housed in containers

In the first project phase up to 2020, 13 sites including buildings and other infrastructure will be renovated. The navaid technology at most of the facilities is housed in containers, which will be brought up to date by the project team. Another part of the project is to upgrade the power supply. Some facilities have brick and mortar buildings that also need to be renovated.

“The first three facilities should be operational by the middle of the year.”

The first three facilities to be upgraded are spread across Germany – in the far north, here in Helgoland, far to the east near the Czech border, and far to the south near Switzerland and Austria. “We are just about done with these three facilities,” says Denis Zrnic. “They should be operational by the middle of the year.”



Construction work: René Wagner (left) and Thomas Langer

By then, each of them must have undergone a flight inspection and received technical and operational approval. The systems must be capable of transmitting and receiving signals for the flight inspection to take place. DFS will notify pilots by NOTAM that they should disregard any signals transmitted by this facility until it is officially in operation.



Selex ES, a well-known provider of high-tech systems in meteorology and aviation, is supplying the technology for the new facilities. This is the first time that DFS has worked with Selex on such a project. The call for tenders for the project was issued jointly with LVNL, the Dutch air navigation service provider. In April and July of last year, René Wagner and Thomas Langer were the first DFS employees to be trained to use the new technology at Selex in the U.S. State of Kansas.

At the same time, work will also begin this year on three more VORs. The second phase of the project, which will upgrade a further 13 facilities, starts in 2020. Whether there will be even more, has not been decided yet.

When possible, the project team will convert the VORs to a Doppler configuration (DVOR). The new DVORs are more precise and less prone to malfunctions than the old systems. As this technology requires more space, it may also be necessary to increase the square footage of the sites. An exception is the VOR on Helgoland. DFS is not permitted to install a DVOR on the island due to local landscape protection regulations. “In an effort to accommodate the islanders, we have chosen a sand-coloured coat of paint for the counterpoise of the new facility, so that

it fits better into the landscape,” explains the project manager. The counterpoise of the VOR station was dismantled into individual components before it was renovated and reassembled on the island.

Back-up

Efforts are being made to agree land-use rights for the navaid sites until 2045. This will allow all VORs and DMEs to be operated for at least 20 years after the second project phase ends in 2025.

With this project, DFS is ensuring that aviation can navigate in German airspace independent of satellite-based systems. Although the major airlines all fly with satellite navigation, there are still plenty of aircraft without GPS on board. The ground-based navaids also serve as a back-up for satellite-based navigation systems. “DFS has the legal obligation of providing terrestrial navigation aids,” says project manager Zrnic. “We will do what it takes to get this job done.”

— *Holger Matthies* —

NOTAM (Notice to Airmen) are issued to disseminate information to pilots about temporary or permanent changes in conditions that are relevant for the safe, orderly and expeditious flow of air traffic. They contain short-term or urgent information of a regulatory nature to supplement the information required for a flight but that do not necessarily require amendments to the AIP (Aeronautical Information Publication).



The view from inside a VOR

The perfect wave

A new world record has been set – 950 aircraft on a single runway on just one day. How does Gatwick tower do it? **We visited the DFS subsidiary Air Navigation Solutions Ltd to find out.**

The first wave of traffic starts at 7 am at Gatwick. This is generally a critical time, and this day in mid-August 2017 is no exception. It is the first leg of the many turnarounds made by the low-cost carriers that make Gatwick their base. All day long, these aircraft fly to destinations across Europe and back again to Gatwick, only to take off again to another destination. If delays occur during this first wave, the spillover effect impacts later flights. Fifty-eight aircraft per hour are scheduled to take off during this first wave. It calms down at about 9 am. At noon, another wave crests with about 55 aircraft movements per hour. A third wave comes in the evening.

On this particular morning, Nigel Owen is on duty as watch manager for Gatwick's

first wave. It is an outbound peak: for every two to three aircraft that take off, only one lands. Outside these peak periods, the rhythm is one to one on Gatwick's single runway. During inbound peaks on the other hand, for every two to three arrivals, one aircraft departs. Normally, separation has been reduced to three nautical miles for approaches. However, during the outbound peak in the morning, controllers separate the jets on approach by eight to ten nautical miles to leave room for the departures.

 *His team can handle this wave, too*

A call comes in for Nigel Owen from the NATS control centre in Swanwick. Seven aircraft headed to Gatwick are in holding patterns above southern England. The control centre asks the watch manager to increase the landing rate so the planes can be taken out of the holding. Meanwhile, several aircraft are queuing on the ground at Gatwick. It seems like there are simply too many planes. But Nigel Owen stays calm. He has been a controller at Gatwick for 27 years and he knows his team can handle this wave, too.

Gatwick air traffic controllers are not alone: staff members of Gatwick Airport Limited, known as GAL, also do their bit. Every morning, two GAL staff members come to work in the tower cab. Their job is to look for free parking positions



understands the transmission and does not request clarification. If that is the case, it quickly adds up.”

Slowpokes not welcome

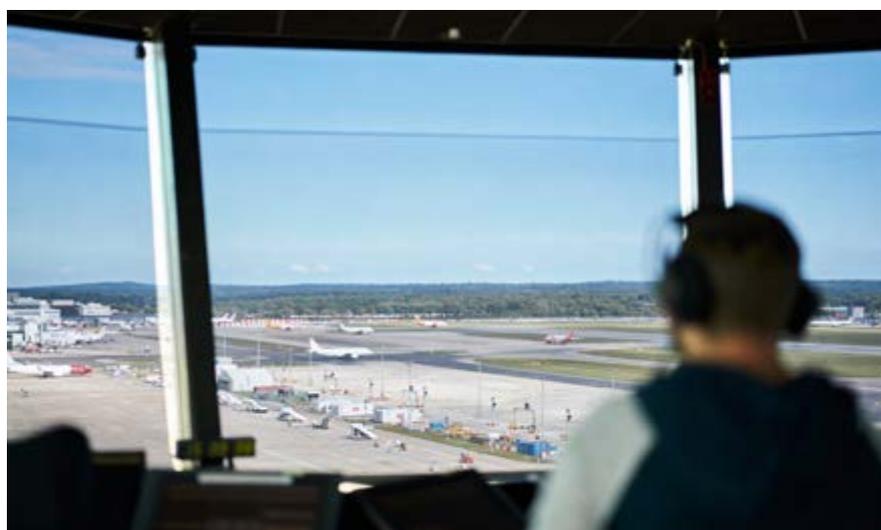
The catch phrase at Gatwick Airport is “runway occupancy time” and almost everything revolves around this. For instance, an Airbus A320 should only occupy the runway for a maximum of 48 seconds at take-off and 53 seconds at landing. Pilots who fly to Gatwick frequently are trained accordingly. They should taxi swiftly with no stopping and vacate the runway as quickly as possible. They manage to do this most of the time but not always. “Oh man, this pilot is acting like he has all day,” complained the ground controller to his colleagues when one jet moved at a snail’s pace onto the runway. You can feel the tension in the air. The slowpoke pilot nearly forced an arrival to conduct a go-around.

Quick but sure

The tower controllers have to handle things tactfully. On the one hand, they have to let the pilots know they need to act quickly. “But we don’t want to push pilots so much that they feel rushed,”

for arriving aircraft and to coordinate which aircraft need to vacate which position when. They recommend a sequence that will enable everything on the apron to run smoothly. In the meantime, the three ANS controllers are concentrated on methodically processing the aircraft, one after another. One controller issues start-up approval (delivery), the second is in charge of ground control and the third grants take-off and landing clearances. An assistant operates the taxiway lighting and traffic lights. The most stressful position is ground control. In addition to handling the aircraft taxiing to take-off and those that have just arrived, this position also has to monitor and coordinate the towing of smaller jets and turboprops parked in remote long-term parking positions to move them to positions with

passenger boarding bridges. “The ground control frequency averages about 360 transmissions per hour”, reported Nigel Owen. “Provided everyone immediately



The view from Gatwick Tower. Photos: Justin Lambert



Watch Manager Nigel Owen: He has been working for 27 years at London's second-largest airport.

explained Nigel Owen. If pilots feel rushed, they would rather accept a go-around than make a mistake themselves. "A go-around is not the end of the world, after all."

Markus Biedermann, head of Gatwick tower, is back in his office, one level below the tower cab. It is almost eight o'clock. He pulls out his mobile and checks his Gatwick app that displays all the important data and statistics in a graph. "There are presently 4,000 passengers in the two terminals who are waiting to depart," explained Markus Biedermann. "A further 2,000 passengers have just arrived." Alone one quarter of these people disembarked from the Emirates A380 that arrives three times a day from Dubai. Gatwick is not just the home of short and medium range aircraft operated by low-cost carriers. Long-haul flights also operate here, for example, Cathay Pacific's A350 or the British Airways fleet of B777s.

Markus Biedermann is in constant contact with the airport operator. Air Navigation Solutions and GAL work closely together so that everything operates smoothly. During the summer months, about 900 aircraft movements per hour are recorded at Gatwick. The American investment firm

that owns the airport, Global Infrastructure Partners, has set an even higher goal called "Sixty for Sixty" which aims for 60 take-offs and landings per hour and 60 million passengers per year. Until now, total passenger numbers have peaked at 45 million. "At Air Navigation Solutions, we aim to help GAL reach this goal," stated Paul Diestelkamp, head of ATM development at Air Navigation Solutions.

While Markus Biedermann's task is to make the most of the current situation at Gatwick while managing operations, Paul Diestelkamp's job is to work with the airport operator to grow the airport. As the political decision was made that there will not be a second runway in the foreseeable future, the airport operator launched a large-scale investment programme in July. This year and next, GAL plans to invest about £1.2 billion to optimise processes – such as the expansion of parking positions, the modernisation of baggage handling systems and the construction of a new hangar.

It will not be possible to achieve large effects at Gatwick, especially not quickly – Paul Diestelkamp is a realist. "Our aim is to develop substantial and sustainable improvements," he explained. The airlines are also involved. Three aspects – procedures, technologies and performance – are the focus. The situation is special because all the air traffic control systems in the control tower belong to GAL. "The airport operator does not actually know the details of air traffic control procedures and technology. They need input from ANS," explained Paul Diestelkamp, who was the project manager of remote tower control at DFS before he moved to London. "In close cooperation with GAL, we have to ascertain how much traffic can be handled on this single runway."

The hurdles that need to be cleared are high. Bottlenecks do not just happen on the ground where one of the ter-

minals is being expanded; there are also bottlenecks in the air. All arrivals to and departures from Gatwick are routed south of the airport to make room for traffic to and from Heathrow, Stansted and London City. "Even aircraft heading north have to fly south first," explained Markus Biedermann. Most traffic from Gatwick is headed towards France. That means that everything in France must be functioning properly for Gatwick to function properly.

"Because everything is so intricately coordinated, things are also very susceptible to disruptions," said Nigel Owen. Fog at the airport or a long-haul aeroplane that has so much tailwind that it arrives an hour earlier – small details like these can disrupt the whole system. The watch manager wants things to remain, in his words, "nice and safe". He and his team pulled it off once again. It is nine o'clock and the GAL staff are saying their good-byes and leaving the tower. The queues of aircraft on the ground and in the air have disappeared and the first wave has been mastered.

— Sandra Ciupka —



Markus Biedermann,
Managing Director



ANS to provide air navigation services at Edinburgh Airport

The UK subsidiary of DFS, Air Navigation Solutions Ltd (ANS), will be responsible for tower and approach control at the Scottish capital city's airport as of 1 April 2018. **The DFS Group will take over from NATS, the UK's main air navigation service provider.**

After taking over operations at Gatwick Airport on 1 March 2016, Edinburgh will be the second UK airport to have its air navigation services provided by the DFS Group. The contract between ANS and the airport operator is for ten years. NATS has committed itself to continue to provide air traffic control staff until ANS has been able to employ enough staff of its own. This model of temporarily leasing employees has already been used successfully at Gatwick Airport.

Edinburgh Airport is the sixth busiest airport in the United Kingdom. It has two runways and handles over thirteen million passengers per year. The current number of destinations is 146. Strong passenger growth has continued in 2018 as the airport record its busiest ever January.

"We are very proud to have been awarded the contract for Edinburgh. This success reflects the DFS Group's ambitions for growth and shows that we are on the right course in the European market," says Klaus-Dieter Scheurle, Chairman and CEO of DFS.



Control tower at Edinburgh Airport. ANS will take over operations here in April.

“Everyone in my team works in the same systematic, logical and structured way.”



Jekaterina Weber

The new normal

Air navigation services were long a man’s domain, but not anymore. Nowadays, many women work in technical and IT fields at DFS. We would like to introduce three of them to you.

Is it difficult for a young woman to work in a team of mostly men? **Jekaterina Weber** definitively says “no”. What is more, she actually thinks it is a strange question to ask. “All of us here are engineers, physicists, or computer scientists – everyone in my team works in the same systematic, logical and structured way,” she explains. The world of this aerospace engineering graduate is not divided into male and female. She is surrounded by colleagues who have the same professional standards that she does. This is important to her – regardless of whether the colleague is a man or a woman. While studying at the Technical University of Berlin, she was also in the minority, as most of the other students were men. She wrote the thesis for her degree at DFS. After graduating, she started working for DFS in the Airspace and Procedures Planning division.

Today, she works for the Satellite and Technical Service department that focuses on safeguarding air navigation service facilities. For example, she has to check whether planned buildings, such as a new high-rise, might potentially affect DFS navigation aids. This is an important contribution to the DFS mission of providing safety to air traffic in Germany. Jekaterina was first drawn to the field of navigation during her studies and she took full advantage of any opportunity to delve deeper into the subject at university. Her knowledge goes beyond air navigation service facilities. During an internship at Lufthansa Flight Training, she also

worked on the navigation instruments on board aircraft.

As a child, Jekaterina already showed an interest in aviation. This is not at all surprising as her father was a fighter pilot for the former German Democratic Republic and her mother was a mechanical engineer. Influenced by the stories and experiences of her parents, no day went by without some mention of technology or aviation. This continues today as her partner also works in the aviation industry. What she appreciates about engineering is that it focuses on understanding the root cause of a problem and then finding a solution for it. “I would not want to work in a field where I needed to learn things by rote.”

Jekaterina Weber’s advice for young women:

- Have a vision and be open to new ideas
- Find and use your strengths, for yourself and for your team
- Rise above it when a man doesn’t immediately think that you are capable of doing something
- Deal respectfully with your counterparts



Sara Hallouda is an engineer in the surveillance services department at DFS. Her main job is working on the large-scale project MaRS that is modernising and upgrading DFS radar facilities. She examines the data quality and performance values of DFS airport radar facilities. A native of Egypt, Sara graduated from the University of Cairo with a bachelor's degree in aeronautical engineering and then moved to live with her husband in Frankfurt, Germany. She received her Master's degree at the Technical University of Darmstadt. Although she has only lived in Germany for eight years, she speaks the language like a native. "It is very important to me not to have a strong accent," she says. This is a woman who does not do anything half-way. Languages seem to come easy to her. She attended a French school in Cairo and grew up with several languages.

She met her husband, a German political scientist with Egyptian roots, when he was visiting his grandparents in the Egyptian capital and was practising basketball at the same club she went to. This inspired her to take German language classes at the Goethe Institute, a non-profit German cultural association. At the University of Cairo, she was one of very few women in the field of aeronautical engineering. However, that did not bother her. On the contrary, she realised there were actually advantages to being a woman in male-dominated fields. "Most of my fellow students were perfect gentlemen. They did things like copy papers for me when I missed class," she says. Her parents are also engineers, her mother for telecommunications and her father for electrical engineering. This alone kept her from thinking it unusual for a woman to pursue a technical profession. Incidentally, Egyptian society is more open to women's careers than might be assumed in the West. Numerous women work as professors at Sara's university in Cairo, for example, in the mathematics department.

Fortuitous circumstances led Sara to apply at DFS after completing her Master's degree. She happened to find out about the company's trainee programme when she was on a class excursion to DFS. "A lot of things immediately appealed to me here – such as the beautiful campus and the high priority DFS gives to reconciling work and family life," says the mother of a two-year-old daughter. After her daughter was born, Sara worked part-time for a while, but now she is working full-time again. "Since I mainly work on the long-term project MaRS, the things I do are also long-term jobs. That means I can easily combine family and work. I am almost always able to pick up my daughter from day-care," she says. However, her next maternity leave is already imminent, as she is expecting her second child this spring.

Sara Hallouda's advice for young women:

- Do everything you do with passion and let your passion motivate you
- Free yourself from external pressures and expectations
- Be curious at all times
- Don't let yourself be easily deterred, be persistent and stick to your game

“In my family, it is not unusual for a woman to pursue a technical profession.”



Sara Hallouda

DFS does a lot to make it possible to reconcile work and family life.



Dr Verena Kleinhaus Photos: Melanie Bauer

Last year held at least two joyful events for **Dr Verena Kleinhaus**. In June, she gave birth to her fourth child and in November 2017, the new iCAS air traffic control system was launched at the upper area control centre in Karlsruhe. The physicist had been working on an important component of this system since joining the company in 2010. “This component is like a baby to me, too,” she says. “iCAS is very close to my heart.”

As a physicist, Verena finds it easy to quickly understand complex interrelationships. This makes her an ideal fit for the company’s systems engineering department. She and her colleagues are responsible for designing the system architecture of this new air traffic control system. They decide which components are required, how they are monitored and how the interfaces to other systems have to be designed. Verena already showed an inclination for physics while she was in school. When quarks came up in her advanced physics class, Verena noticed that the teacher did not know much about these particles. That is when she decided to devote her studies to this topic and find out herself. Indeed, she devoted her dissertation in the department of nuclear physics to quarks.

“After completing my PhD, I didn’t want to stay in research but decided to do something more tangible,” she says. She heard about DFS when she attended a business contact fair in Cologne. She was then invited to an interview by her current boss, who was immediately impressed by her qualifications. She already had children at that time. Her first daughter was born while she was doing her PhD.

In her twelve-member team in systems engineering, she is one of two women. In this job, she says, it makes no difference whether she works with men or women. “The imbalance between men and women

does not play a role in our daily work,” she says. She has never been subjected to snide remarks as a woman in a predominantly man’s domain.

Despite having four children, she would not want to give up her profession. She says that it is exhausting sometimes, but if you really want something, you can do it. “DFS does a lot to make it possible to reconcile work and family life,” she says. She is not interested in part-time work as a long-term solution. She is too passionate about her work to do that.

Dr Verena Kleinhaus’ advice for young women:

- Decide exactly what you want to do, and then actually start working on it
- Do what you enjoy doing and don’t let yourself be deterred by other people’s preconceived notions
- You can do anything you set your mind to

— Sandra Ciupka —

DFS launches sophisticated system in Karlsruhe

A brand new air traffic management (ATM) system was launched at the Karlsruhe control centre in December 2017. This is the first step towards standardising the systems used in Europe.

The system will speed up and improve the handling of air traffic in upper airspace. The successful launch also means that plans to implement the system at all DFS control centres across Germany can proceed.

DFS had invested more than ten years of development time, countless tests, training courses, technical modifications and several weekends of trial operations before the new ATM system was ready to launch.

The future has arrived

With iCAS, DFS has created the conditions needed for even more flexible control of air traffic in upper and lower airspace. The new system responds faster, is more powerful and displays targets more precisely than the system it replaces. The new functionalities that iCAS delivers are particularly pertinent for lower airspace as they will allow airspace users to fly to their destinations independently of fixed routes in the future. This free route airspace concept will be expanded considerably in Europe in the coming years.

“The first step has been taken in creating a new systems future at DFS and its European partners,” said Robert Schickling, Managing Director Operations at DFS. “With this new, state-of-the-art system, we are responding to our own aspiration to be a technology leader in the world of air navigation services.” DFS is currently working on adapting the system to the needs of its three control centres for lower airspace. The launch at these locations is scheduled to begin in 2021.

“Our goal is to have a standard system in place at all our units,” said Schickling.

i as in iTEC

iCAS is part of the joint European project iTEC (interoperability Through European Collaboration). Several air navigation service providers have joined forces in this alliance to develop a new generation of ATM systems with common core components, together with the Spanish IT company Indra. In addition, iCAS also uses tried-and-tested components from the portfolio of the DFS Systems House. The aim is to make the ATM systems of the individual countries compatible by means of common standards.

DFS has been working on this with LVNL (the Netherlands), PANSO (Poland) and Oro Navigacija (Lithuania). The iTEC Alliance consists of the DFS Group (Germany), NATS (United Kingdom) with its

project partner AVINOR (Norway) and ENAIRE (Spain). The benefits of standardised ATM systems across Europe include improved collaboration and lower maintenance costs.

Karlsruhe UAC – the DFS control centre for upper airspace

The DFS upper area control centre (UAC) in Karlsruhe has controlled traffic in the upper airspace of Germany since 1977. Upper airspace starts at approximately 7,500 metres. Annually, about 1.8 million flights cross this airspace above Germany. Karlsruhe UAC was the first European control centre to introduce a very advanced ATM system in December 2010. With the introduction of iCAS, Karlsruhe is once again one of the most advanced air traffic control centres in the world.

— red —



Control room at Karlsruhe UAC. Photo: DFS

DFS subsidiary at Lake Constance airport

In the future, air traffic at Bodensee-Airport Friedrichshafen, situated on Lake Constance, will be controlled by DFS Aviation Services. The DFS subsidiary will replace the Austrian air navigation service provider Austro Control there from 1 July 2018 on. In addition, it will support the modernisation of the airport.

DFS Aviation Services, which currently controls air traffic at nine regional airports in Germany, has gained a new customer. From 1 July 2018, the subsidiary will be responsible for controlling air traffic at Bodensee-Airport Friedrichshafen on the shores of Lake Constance in southern Germany. DFS Aviation Services will take over all eight air traffic controllers at the site, where the Austrian air navigation service provider Austro Control currently operates. The contract with the airport on Lake Constance has been concluded for a term of eight years.

DFS Aviation Services will not only provide air navigation services at Friedrichshafen, but will also train their future air traffic controllers. Furthermore, the company will support the airport operator in technical matters such as replacing air traffic control systems and optimising air navigation services. In addition, the DFS subsidiary will advise the airport on finding a replacement solution for its current tower. The control tower built in the 1950s is in need of renovation and no longer provides sufficient space. "DFS Aviation Services already boasts Germany's highest-traffic regional airports among its customers. We are pleased to be able to contribute our many years of experience to Bodensee-Airport Friedrichshafen, which has a rich tradition," stated Dirk Mahns, Managing Director at DFS Aviation Services.



Dirk Mahns, CEO of DFS Aviation Services GmbH (left), and Claus-Dieter Wehr, CEO Flughafen Friedrichshafen GmbH, in the control tower.

Bodensee-Airport Friedrichshafen is Germany's southernmost airport. It was founded in 1913 for the Zeppelin industry, making it the second oldest airport in Germany after Hamburg. In 2017, 9,919 take-offs and landings under instrument flight rules were recorded at the airport. Over the same time span, more than half a million passengers passed through the airport. "We are pleased to have found

a competent and reliable partner in DFS Aviation Services who will support us in our plans for the future of the airport," says Claus-Dieter Wehr, Managing Director of Bodensee-Airport Friedrichshafen.

Cross-border upgrade of ILS facilities

DFS has concluded an agreement with the Dutch air navigation service provider about the replacement of instrument landing systems (ILS)

In the future, DFS Deutsche Flugsicherung GmbH will procure instrument landing systems together with LVNL, the ANSP of the Netherlands. The two air navigation service providers have concluded an agreement which will be effective for 13 years. The agreement covers the upgrade of ILS facilities at eleven German and four Dutch airports as well as three test and training systems. The joint procurement will secure DFS and LVNL substantially better conditions when purchasing these systems. In total, DFS and LVNL will spend tens of millions by 2030 on the replacement of their ILS infrastructure.

An instrument landing system is a ground-based system installed at an airport. During final approach, it guides pilots to the touchdown zone, making it possible to land in almost any visibility. DFS operates around 50 instrument landing systems at its 16 international airports, and LVNL a total of 10 systems. The maximum service life of such an ILS system is around 20 years, which means that the two companies have to replace three systems every year on average. In their agreement, DFS and LVNL have for the first time defined common technical requirements on ILS systems. The new systems will be supplied by the French aviation and technology group Thales who won the joint tender.

One facility will be installed as a training system at Kaufbeuren air base where it will be used to train DFS technicians. The second facility will serve as a reference system. On the DFS campus in Langen, reference systems of all technical air navigation services facilities are provided in order to test spare parts after repair, for example. The first operational ILS systems will be supplied in 2018. They will be installed at the airports of Hamburg, Nürnberg, Hanover and Schiphol in Amsterdam.

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Landing aircraft at Schiphol Airport.



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