

Issue 1 – 2023

transmission

The DFS magazine

"It's about the security of
our country."

Interview with Lieutenant
General Ingo Gerhartz

Perfectly prepared
Civil-military cooperation pays off

Aces high

Joint Forces Air Component Headquarters



DFS Deutsche Flugsicherung

Dear reader

Normally, anyone who masters a difficult task with flying colours is rewarded with praise and recognition. We as a company are lucky enough to be enjoying the respect of others right now thanks to how we performed during the months-long preparations for Air Defender 2023, the large-scale exercise organised by the German Air Force. Many tasks had to be tackled. How can we maintain the usual high level of safety at all times? What do we need to do to minimise the impact on civil air traffic? These questions were clarified in working groups in the run-up to Air Defender. Our experts have been contemplating these challenges and our entire company has been sharing in the excitement. It was worth it in the end. The performance of DFS was received positively by everyone. The German Federal Minister of Defence, the generals involved, and those responsible in the civil aviation industry paid us the highest tribute for our performance. Air Defender also ran smoothly in terms of air traffic control.

In this issue of the DFS magazine *transmission*, we look back at the large-scale exercise. In an interview, Lieutenant General Ingo Gerhartz discusses the importance of Air Defender for NATO's defence capability. We show how the individual DFS control centres were

involved in the success of the exercise. Without exception, all employees are proud of what we have achieved. There can be no better seal of approval for the One DFS philosophy. And, of course, this issue of the magazine is also full of impressive photos of the Air Force.

The fact that we have practised civil-military integration in air traffic control in Germany for almost 30 years contributed a lot to this success. Air Defender is proof of how useful this type of cooperation is. The large-scale exercise has brought civil air traffic control and military airspace users even closer together. We have many colleagues with a military background. In the future, it will be important that we pass on this knowledge to the next generation. Our Civil-Military Affairs division does important work in this regard.

When this magazine is published, the volume of holiday traffic will peak. As an air navigation service provider, we do everything we can to ensure that all passengers arrive safely and punctually at their holiday destination and back home again. In this spirit, I wish you and all of us a wonderful summer!

Yours

Arndt Schoenemann



Arndt Schoenemann
Chairman and Chief Executive Officer

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"It's about the security of our country."

Lieutenant General Ingo Gerhartz was described in the German press as the **"Boss of Air Defender"**. In *transmission*, the Chief of Staff of the German Air Force talks about the role of DFS in the large-scale exercise, the advantages of the F-35 fighter and his relationship with the Israel Defence Forces.

Mr Gerhartz, *Air Defender 23* went very well. What role did DFS play in this success?

INGO GERHARTZ: I would like to express my sincere gratitude to DFS. This is a very special matter for me. DFS made the smooth running of the exercise possible through precise preparation and close cooperation. As a result, the impact on civil air traffic was negligible. We've made Air Defender a joint success.

In Germany, civil-military integration of air traffic control has been practised for almost 30 years. How did you experience this as Chief of the German Air Force?

GERHARTZ: The Air Force and civil aviation have changed enormously in recent decades. We are talking about a period of time from the Cold War, from a united Europe to the current challenges of war in Europe. I very much appreciate the working relationship between civil air traffic control and the Air Force. For example, almost every week a civil aircraft loses contact with air traffic control,

triggering a call from Kalkar, and all agencies work closely to restore safety in German airspace as quickly as possible. This is extremely professional and has proven its worth over decades. Even if aviation is different today than it was 30 years ago, our common goal has remained unchanged: safe and secure military and civil air traffic.

Is it true that *Air Defender 23* was your idea? And if so, what prompted you to take this initiative?

GERHARTZ: Yes, indeed. On my inaugural trip to the United States, I suggested organising an exercise similar to the Army's Defender exercise series. That was in 2018. The aim was to show that we, as the Air Force, are the first responder in a crisis. We can deploy in hours, whereas the army and navy naturally take weeks or even months. When we look back on 2018 today, the war in Ukraine could not have been foreseen at the time. We proposed 2023 because we are in the Very-High-Readiness-Joint-Task-Force phase of

readiness right now and therefore there is no other major exercise being held in Germany. So, there were very practical considerations behind choosing this time. Today, we can say that we have achieved our goal. We have shown that as NATO we are capable of defending our territory. I am particularly proud that Air Defender was a German-led exercise, one of ours.

[What do you say to critics who say that an exercise like Air Defender is too warlike and could provoke Russia?](#)

GERHARTZ: Air Defender was a purely defensive exercise. As a possible response to an acute threat, we have been practising the rapid, joint deployment of air forces, primarily in and over Germany. The defence of NATO territory is at the core of the Alliance. The 100 or so aircraft of the U.S. Air National Guard, in particular, make it clear how important transatlantic solidarity is. Incidentally, as quickly as we, the air force, can be there in a crisis, we can also send a de-escalation signal by redeploying.

[They say you have stopped the wave of jet pilots quitting. How did you manage that?](#)

GERHARTZ: At the end of the day, it's all about attractiveness. If you like doing your job, you will stick with it. In 2018, we struggled with operational readiness for all weapon systems, especially the Eurofighter. Our pilots still got the required flying hours, but that was all they could do. In close cooperation with industry, we have improved the operational readiness of the Eurofighter to 85 percent. Flying hours are now available again to build up professional experience and be at the forefront of NATO. A deployment to Australia and Japan with the Eurofighter would have been unthinkable a few years ago. The same applies to Air Defender. We have managed to make our partners in the Alliance not only trust us, but other European nations point to us as an example. That is motivating! Resignations are no longer an issue and some of the comrades who left us in 2018 are now part of the team again.

[What are the biggest challenges facing the Air Force?](#)

GERHARTZ: The greatest challenge lies in the modernisation of our weapons systems. For me, these are three major projects first and foremost: the introduction of the F-35, the heavy-lift transport helicopter and air defence. I was very happy with the decision to go with the F-35. We are working flat out to ensure that we can start pilot training in the United States in 2026 and launch the first aircraft from Büchel Air Base the following year. To ensure continued air mobility of the Armed Forces, the contracts for the purchase of the Chinook must be signed soon. The CH-53 is now basically a museum piece and can only be operated with a lot of effort. On the other hand, every forest fire makes clear how important such a system is. The Chinook will be easy to integrate into the Air Force, not least because of the experience of other NATO countries. In addition, we are modernising the entire air defence system.

[Does this also have something to do with Russia's attack on Ukraine?](#)

GERHARTZ: The Ukraine conflict shows that a country's population and critical infrastructure can only be protected if the entire range of threats, from combat drones to ballistic missiles, is covered. But there is no one-size-fits-all solution. Therefore, we need a mix of different systems: IRIS T-SLM for low altitude, the modernisation of our tried-and-tested PATRIOT systems for medium range and a system like Arrow 3 capable of engaging ballistic missiles from long range at high altitude. In all projects, we are in close exchange with the procurement authorities and industry to move things forward. Ultimately, the security of our country is at stake and the troops cannot and must not wait either.

[The decision to acquire the Lockheed Martin F-35 as the successor to the Tornado fighter jet is also due to your initiative. What was the argument for the F-35?](#)

GERHARTZ: There were many! The F-35 is the most modern fighter aircraft in the world. It is proven and highly capable, boasts a low signature and has state-of-the-art sensor technology and high networking ability. It is the fifth-generation fighter aircraft in NATO,

which is now also flown by many European countries. This opens up countless opportunities for cooperation in training and deployment. We have procured the system including armament and maintenance, which will save us years of certification and avoid shortages of spare parts. The F-35 is the answer to the challenges of our time because our credible response and deterrence capability is the basic prerequisite for our security.

You are also perceived by the public for having a close relationship with the Israeli Air Force. Why is this cooperation so important to you?

GERHARTZ: I made my inaugural visit to Israel as Chief of the German Air Force in mid-2018, not least because the good relationship with our Israeli friends is very close to my heart as a result of our shared history. The Israeli Air Force (IAF) is one of the most experienced air forces in the world. We have realised during numerous joint exercises that we can learn a lot from each other. The IAF's first visit to Germany benefitted crews on both sides. We are not

only concerned with military cooperation, however. It is about bringing people together, especially young people from both countries. Meanwhile, young Israeli soldiers of various ranks regularly visit our training facilities in Germany. The invitation to participate with our Eurofighters in the 75th anniversary celebrations in Israel showed me that our commitment is well recognised.

Being Chief of the German Air Force is certainly not an easy task. What aspects of your daily work do you particularly enjoy?

GERHARTZ: Quite clearly, it's the servicemen and servicewomen of our Air Force who give their all every day, working together and ensuring that the people in our country continue to place their firm trust in us in the future. Direct contact with young comrades who are still at the beginning of their training is particularly close to my heart. They are our future. That is why I am always happy when young people decide to join "Team Luftwaffe".

*The interview was conducted by
Sandra Ciupka.*



Lieutenant General Ingo Gerhartz Photos: Bundeswehr

Perfectly prepared



Military liaison officers at the DFS control centres ensured that arrangements were made quickly during the large-scale exercise. Photos DFS

The DFS control centres and the experts at the DFS Headquarters started working on the exercise long before Air Defender 23 began. Before and during the large-scale exercise, there was a lively civil-military dialogue.

Bremen Control Centre

Preparation on the simulator

Weeks before Air Defender 23, the Bremen control centre tested on the simulator whether the interaction between civil and military partners would work. For this purpose, the coordinator of the NATO exercise and representatives of the squadron leadership were guests at DFS.

"The aim of the simulations was to test the approach and departure procedures specially designed by the military aerodromes in Schleswig and Hohn for the large-scale exercise, as well as the transfer procedures to the tactical air command and control service," explained supervisor Ralf Theelen. The simulation runs were designed by the Bremen members of the military competence team together with the simulator experts. Three simulation runs took place on each of the three days for a total of 25 participants.

The military partners used the knowledge gained during the individual simulation runs to modify their procedures and arrangements, and to discuss them with all parties involved. Topics were identified in technical discussions to then start the exercise with a common understanding of what was involved.

Twelve of the 25 military aerodromes as well as a large part of the German military training airspaces are located within the flight information region (FIR) Bremen. Around 40 percent of Germany's military training flight operations take place in these areas. The knowledge of military operations among Bremen's air traffic controllers is therefore high. Thanks to the members of the military competence team, this knowledge is continuously passed on to new trainees. The military competence team has been in place since 2017 and ensures that military expertise is maintained and enhanced. (nau)

Karlsruhe Control Centre

An unusual sight for the Karlsruhe air traffic controllers

The shared passion made the Air Defender exercise at the Karlsruhe control centre a success. The editorial team visited the control centre on an exercise day.

The Air Defender organisation team at the Karlsruhe control centre meets in a meeting room on the second floor. It is the penultimate day of the exercise, and a large projector casts the current agenda onto the wall. The internal eleven o'clock meeting is about the upcoming activation of airspace South. Three such internal meetings are held daily. In addition, there are DFS-wide briefings. The first item on the agenda of the briefing is the staffing situation. Few people have reported sick, meaning Karlsruhe will get through the following day smoothly. At a fast pace, the next item on the agenda is dealt with. Traffic volumes are about eight percent below the norm. A look at the delay figures makes everyone a little puzzled. The numbers on the wall are much higher than on previous days. This is mainly due to the imminent thunderstorms over Germany.

The airspace controlled from Karlsruhe includes the training airspaces East and South. "There are two hours of game time per training airspace," said Jessica Schicht. This makes it sound like a leisure pursuit, but the seriousness of the scenarios being trained is visible to all. "In Fight Airspace East, for example, they are training to defend Rostock from attack," she explained. The coordinator is one of the three main organisers in Karlsruhe for the large-scale exercise and normally responsible for special-use-of-airspace issues. "The fighter jets are already so heavily loaded on take-off that they have to refuel shortly afterwards," she said, explaining the division of airspace. For this purpose, the jets fly into the admin airspace to the south of airspace East, where tankers await them. Having up to three tanker aircraft circle one above the other refuelling jets is something special for the controllers. "It was a challenge at the beginning when several jets from different levels wanted to refuel,"

explained one air traffic controller. But after two days, the processes have been modified and refuelling can be smoothly supported by the air traffic controllers. The first hour of the total four-hour activation of the airspace is needed for refuelling the jets. After the aircraft are refuelled, the two-hour "game time" starts, as it was jokingly referred to by the controllers.

During these two hours, the aircraft fly their exercise scenarios in several waves. Looking at the radar, eight aircraft can be observed splitting up. The eight dots on the radar move towards each other from the north and south and then only one single clump can be made out. Everything is going according to plan, but it is a rather unusual sight for the air traffic controllers.

Fostering understanding

Daniel, the Air Force liaison air traffic controller, stands in the control centre in a camouflage uniform while his comrades are stuck in the clump. He volunteered for this duty and now answers every question about military aircraft movements. "We are learning an extreme amount about civil-military cooperation right now," was one observation. With his presence and open manner, the interceptor controller helps to promote understanding on both sides.

For the Karlsruhe control centre, preparations for Air Defender 23 started in spring 2022. The entire branch is now spending two weeks focusing on military flight operations, illustrating the great commitment of the controllers. Now, on Wednesday afternoon of the second Air Defender week, it is time for an interim assessment. Everyone agrees on the positive effects of the large-scale exercise. (abs)

Langen Control Centre

A corridor poses a challenge

During Air Defender 23, traffic in Langen airspace was mainly impacted by the southern scenario.

Its planning for Air Defender 2023 began a year and a half before the first fighter jet took

off. Björn Wahl, who is responsible for military issues in the Langen OPS Support Office, took part in around 40 coordination meetings during this time in preparation for the largest military airspace exercise since NATO came into existence, with representatives of the Bundeswehr, the German Armed Forces, with the chiefs of section (COS) as well as the experts and managers from other DFS branches, DFS central divisions and from EUROCONTROL in Maastricht. They all helped to reconcile the ideas and needs of the military with the structures and possibilities of air traffic control.

"When it became clear that this exercise would have an impact on civil air traffic, there was a willingness to compromise on both sides that had not always been there in the beginning," said Wahl. This involved such things as the establishment of airspaces, procedures and the transfer of aircraft. In addition to Björn Wahl, COS Daniel Klein and supervisor Matthias Volk were part of the coordination team at the Langen control centre, which was responsible for all issues related to Air Defender 23.

For this purpose, a regular meeting of all the COS concerned with operational performance management and the Civil-Military Affairs division took place every second Friday before the exercise. In addition, there were regular rounds with the COS responsible for procedures and capacity.

Of the three scenarios in the exercise (north, south and east), it was mainly scenario south that played a role for the airspace controlled from Langen. It comprised two military training airspaces, known technically as TRA for temporary restricted area: TRA 205 Lauter over the Palatinate, in the southwest of Germany, and TRA 207 Allgäu, in the far south of Germany. A corridor was set up between the two for the duration of the exercise, through which military aircraft flew from one TRA to the other.

While military traffic in the TRAs themselves is normal, the corridor between the two TRAs

posed a real challenge because it was an airspace in which military flight operations do not normally take place. As it was on the departure route of Frankfurt Airport's western runway, only aircraft types with a specific climb profile were allowed to take off there for the duration of the exercise between 13:00 and 17:00.

Parts of the terminal control area of Stuttgart Airport were also under the corridor. "In the approach and departure area of Stuttgart, we therefore lowered the capacity for the time of the exercise," said COS Klein, which required new procedures to be specially developed. The effort and meticulous preparation paid off and, in the end, the impact on civil aviation was far less than expected. (hma)

Headquarters

Fine-tuning the airspace

Operational Support at DFS Headquarters started preparing the large-scale exercise from March 2022 onwards.

Initially, the focus for the special-use-of-airspace (BNL) team was on the military training airspace. At numerous meetings with the Bundeswehr, the DFS branches and the Civil-Military Affairs division of DFS, details were refined in order to mitigate the operational effects.

After the airspace design was established, the focus shifted to procedures. Here it was a matter of forming everything into a temporary letter of agreement. It therefore took a lot of coordination, such as with EUROCONTROL's Network Manager. The aim was to minimise unnecessary flight paths and delays.

The planning and implementation of Air Defender was only possible with the cooperation of all DFS units involved.



Aces high

The Joint Force Air Component Headquarters was the command centre of Air Defender 23, the large-scale military exercise held recently in Germany. From there, the participating squadrons received their orders, known as air task orders. *Transmission* paid a visit to this "nerve centre".

It is Thursday, 22 June. The last day of Air Defender 23. At 11:00, the first exercise of the day begins in the eastern airspace. The scenario: The port of Rostock on Germany's Baltic coast is under attack. A part of Germany is occupied by a militant group, supported by a hostile power that has already brought mercenaries into the country. The German Air Force and its NATO partners have to repel the attack on Rostock and at the same time protect a convoy of vehicles that the enemy is also targeting.

"We practise as we would fight," said Colonel Gerhard Roubal. That is crucial according to Roubal. Even the vehicles on the ground are real. Paratroopers are dropped to them. "The only difference to a real-life scenario is that we don't use weapons. And, we also plan the enemy operations," he added with a smile. Roubal, Director Operations, is not the only

one in high spirits this day. The mood at the Joint Force Air Component Headquarters, or JFAC HQ, is generally relaxed. Air Defender has gone smoothly. Apart from the exercise in the east, there are only two missions left – one in the south, the other in the north. Due to thunderstorms, the exercise in southern Germany is scaled down and rescheduled to four-on-four air combat. For the northern exercise in the evening, the weather forecast looks better again.

When asked if such an exercise is also fun, Colonel Roubal, former Phantom pilot and Commodore, points to the 80 or so people at their working positions around him. "You can see for yourself. Everyone here is highly motivated." The JFAC is located in a tent at the Air Operations Command in the barracks in Kalkar. Those who have passed the access control of the base are checked again in front

of the tent. The exercise scenario is fictional, but not unrealistic. How Air Defender works in detail must remain a secret.

That is why there are no photos of the big screens at the front of the tent. They show what is currently happening in the airspace. There are still 45 minutes until the start of the mission in the east. The first tanker aircraft circle in the designated areas. The fighter jets then gradually arrive in the training airspace. The 'air boss', in this case a pilot from Tactical Air Wing 73, stands up and reports what is about to happen in a loud voice for everyone in the tent. He prepared today's exercise. Air Defender was planned in broad outline in years of detailed work. JFAC translates all this into concrete air task orders. "We are in the nerve centre of the mission, so to speak," is how press officer Daniel Waite described it.

The effectiveness of the training must be ensured

"We make sure that there is a training benefit in each mission, but most importantly, we guarantee safety," Colonel Roubal stressed. Since the beginning of Air Defender, the members of JFAC have been working at their limit. The days are long – the Headquarters is in operation for 14 to 16 hours. The exercise is "a monster". Instead of the maximum of 80 flights for which air task orders are created on normal training days, there are up to 227 per day during Air Defender. The JFAC, for example, lays down who refuels how much and when, and who uses which frequency. In addition, the JFAC team knows which aircraft are not available as planned, perhaps for technical reasons.

Concentration is important

Liaison officers from EUROCONTROL and DFS, among others, are also based on the ops floor. On this last day of Air Defender, DFS staff member Petra Allhoff has been on duty since shortly before 6:30. Her departmental colleague Andreas Miltner will join her later and then take over the evening shift. Since the beginning of Air Defender, the two DFS experts have been providing support, for

example, in the coordination of routes and are generally available for all questions relating to air traffic control. They also extract the information necessary for air traffic control from the air task orders and distribute it to the DFS control centres and the EUROCONTROL control centre in Maastricht. Just as Allhoff is about to take her coffee break, a soldier approaches her who wants to change a flight plan and needs help. "At the beginning of Air Defender, the forces of the NATO partners in particular had issues with flight planning," she related.

In the tent, everyone is waiting for the start. There is a lot of talk. Suddenly, someone shouts "Noise level!". Immediately, it is quieter so that everyone can concentrate better. "The air traffic control liaison officers at JFAC are extremely valuable for our work," said Colonel Roubal. In the meantime, the Commander Air Operations Command, Lieutenant General Thorsten Poschwatta, has also arrived. "Air Defender went extremely well," he confirmed. Only the first one and a half days were characterised by friction until everything had settled down. "Germany has proven that it can act as a hub for NATO air defence. The Bundeswehr has taken on a leadership role and we have gained valuable experience," said the Lieutenant General.

"Of course, this also serves as a deterrent..."

In the process, the Air Force gained important insights even before Air Defender began as more than 100 fighter planes were transferred from the United States to Germany within four days. This was a logistical feat, in which the ANSPs involved also played a role. "The importance of the exercise for NATO was also demonstrated by the visit of Secretary General Jens Stoltenberg to Jagel Air Base," said Roubal. Air Defender had been planned long before the Russian invasion of Ukraine, but the war had given the mission a new meaning. The German Chancellor proclaimed a break with the past as regards defence. "Of course, this also serves as a deterrent to Russia," said Roubal.

With Air Defender, JFAC had gone to the limits of what was possible, also in terms of duty times. "It has been shown that our soldiers are excellently trained," said Lieutenant General Poschwatta. He stressed that in addition to the Air Defender missions, normal everyday life also had to be dealt with, such as the alert rota to defend against terrorist attacks with civil aircraft.

For Colonel Roubal, after the exercise is before the exercise. "Next time, we might also involve the army and navy in such an exercise," he said. But until then, there will still be a few years to go. First of all, everyone at the Air Operations Command will celebrate that Air Defender 23 went so well.



Petra Allhoff, DFS Liaison Officer at JFAC, with Colonel Gerhard Roubal. Photo: German Bundeswehr

–Sandra Ciupka–

Counter-terrorism in German airspace

The National Air Security Centre (NLFZ) on the Paulsberg mountain in Uedem, North Rhine-Westphalia, just ten kilometres from Kalkar, was also involved in Air Defender. There, DFS staff member Andreas Krebber works on behalf of the German MoT in the interdepartmental institution. From Uedem, the entire German airspace is protected against terrorist attacks like those of 11 September 2001. With the German Air Force sending out Eurofighter alert formations from here if an aircraft is considered suspicious, the German Federal Police and the German Federal Office of Civil Protection and Disaster Assistance (BBK) are also present there in addition to DFS. There is also NATO's counterpart at the site, which monitors the entire European airspace.

The NLFZ team prepares every morning at eight o'clock for all flights of special importance, such as trips by federal ministers. Special attention was also paid to the Air Defender missions. "The war in Ukraine has once again improved civil-military cooperation, we have grown even closer together," said Lieutenant-Colonel Stefan Bremkens. As an example, he and Andreas Krebber cite the establishment of the corridors for military flights at the beginning of the war. "The experience regarding the working relationship between DFS and the German Armed Forces during the establishment and use of the corridors at the beginning of the Ukraine war was helpful for the smooth implementation of Air Defender," said Krebber.



Air Defender – taking stock

The large-scale military exercise Air Defender 2023 took place in German airspace in June. The impact on civil air traffic was less than feared, thanks to the good work of DFS and others.



55,000

minutes of delay per day in European airspace had been forecast by EUROCONTROL as a result of Air Defender.

In fact, there were only half as many: on average,

22,000

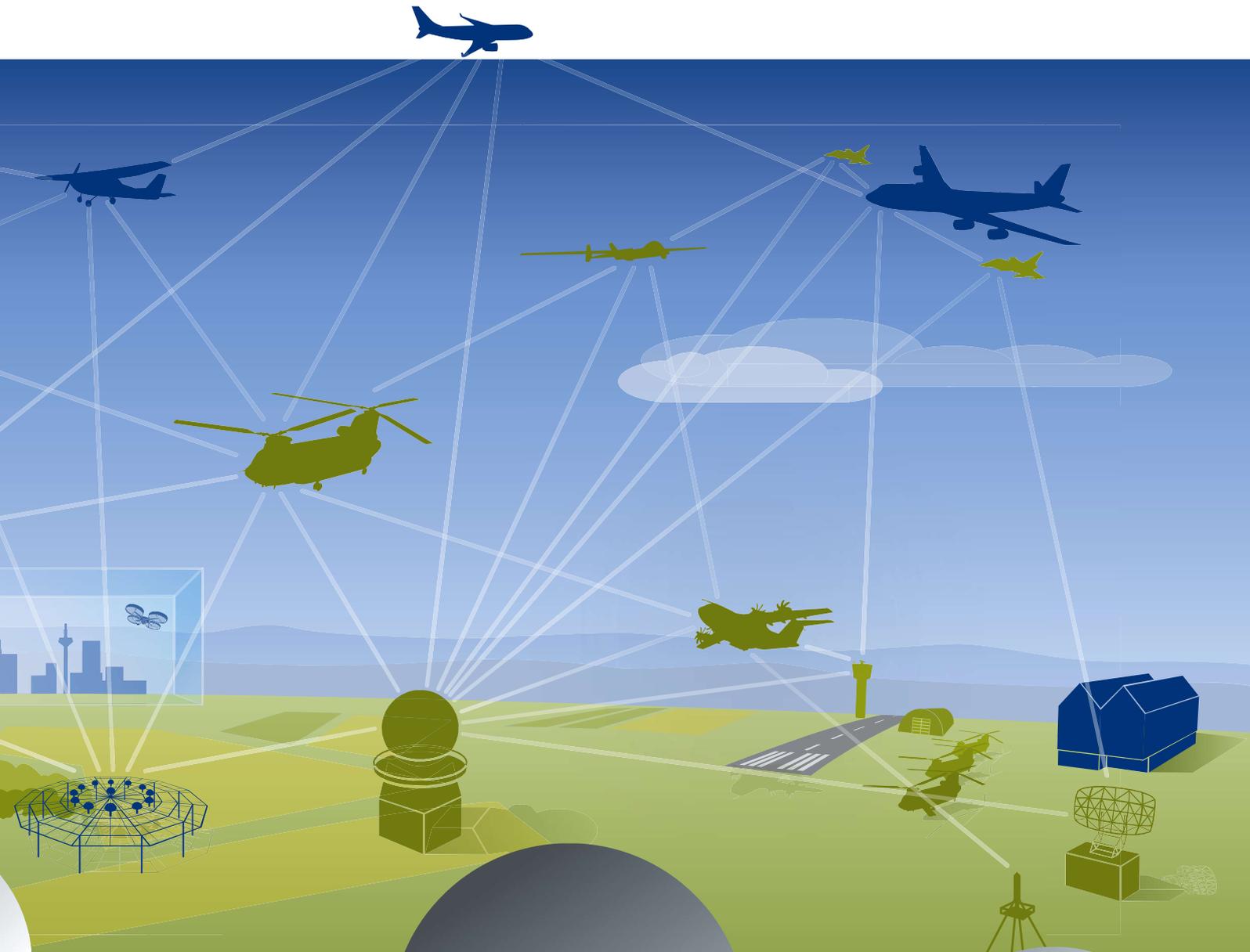
minutes of delay were due to the exercise.

25
nations

Towards the end, thunderstorms caused delays. On the last day of the exercise, there were more than 85,000 minutes of delay.

Only one delay in **four** was due to Air Defender.

More than
220
aircraft



Around
10,000
soldiers

Just under **20**
percent more DFS
controllers were on duty
during the exercise.

90 percent
of the around 2,000
planned military flights
were completed -
a top figure.

The surge in personnel at the
Bremen control centre was
particularly high. Here, DFS
increased the number of shifts by

40
percent.

Meshing theory and practice

A methodology refresh: For more than a year, the DFS subsidiary Kaufbeuren ATM Training GmbH (KAT) has been training new military air traffic controllers using a new methodology.



From left to right: Training in the tower simulator with Laura Ballhausen (instructor and lecture hall head at KAT), Staff Sergeant (OA) Chris Lechthaler, head of division Norman Lugauer, Senior Officer Cadet Fynn Matzke and Daniel Bruderrek (instructor and lecture hall head at KAT)

The three-storey KAT training centre is a new building located in Kaufbeuren in southern Germany. In October 2019, training operations began there for the next generation of air traffic controllers of the Bundeswehr, the German Armed Forces. Its facilities are state-of-the-art. On 2,400 square metres of floor space, students have access to numerous classrooms and seven lecture halls, as well as two brand-new radar simulators and a high-end 360-degree tower simulator. Teaching is exclusively digital – 80 high-end Microsoft Surface tablets were purchased and a WI-FI network was installed in the building, over which the computers are

regularly synchronised with the latest training content.

Until recently, however, the methodology for teaching this content had not been quite so new. Since 2001, the training had taken place in an unchanged form, with a strict division into a classroom-based and a practical part, and modern training concepts were not in use for the most part. That is now history. In April this year, the first course completed its training at KAT, learning the basics of military air traffic control based on a new methodology.

'Competence orientation' is the watchword of the new concept. This criterion was a requirement of the Bundeswehr, which plans to base all its training courses on the concept by 2030. "Competence orientation means that the students don't learn for an exam, they learn for later everyday life in military air traffic control," said Norman Lugauer, Head of KAT's air traffic control training and simulation division since 2020. The 40-year-old Lieutenant Colonel in the reserves is an experienced aviation specialist whose expertise in theory and practice covers an impressive range. In addition to a degree in aerospace engineering, he has 13 years of service as an air traffic control officer in the Bundeswehr, a Master of Business Administration (MBA) in air traffic management and a certificate as a flight procedures designer. As the holder of a private pilot's licence, he occasionally sits at the controls of a Cessna himself.

The starting point for the development of the new concept was the Bundeswehr's endeavour to reduce the failure rate of military air traffic controller trainees during their training in Kaufbeuren. "The Bundeswehr found the failure rate at the academy too high," said Lugauer. "We then analysed the causes and how it could be improved." One solution that the KAT specialists found was to dovetail classroom-based theory and practical exercises more closely.

No more rigid demarcation

Before, the training in Kaufbeuren had lasted nine and a half months, consisting of three and a half months of theory followed by a six-month practical part. Both parts were strictly separated from each other, only when the theory block was completed did the students go into the simulator for the first time. The new course developed by KAT consists of three modules. The first module lasts 13 weeks, the second 12 and the third 11.

"The first six weeks of the first module are pure theory, after that there is a regular alternation of theory and practice," said division head Lugauer. "That means from

then on, the students are in the simulator every other week, applying what they have learned in theory classes the week before."

In the second module, students alternate between theory and simulator every week right from the start. At the same time, the complexity of the training is ramped up, with the focus in this module on instrument approach procedures and military specifics.

In the third module, the focus is on combined training. Here, the tower and radar approach units are combined in the simulator. The trainees no longer work with an instructor as before, but with another trainee sitting opposite. Both tower and radar positions will then have students who communicate with each other via radiotelephony. "This way they learn in a hands-on way why they should be brief and work with standards," said Lugauer. Bad weather, formation and night flights as well as emergency procedures are further subjects covered in the third module.

At the end of each module, there is a graded assessment with one theory exam and one in the simulator. Those who pass continue their training in the next module. In the simulator you have two chances. If you fail in the first run, you can still qualify for the next round with a second attempt. If you fail there too, you have to repeat the entire module; the break until the restart should be a maximum of five weeks. The short time interval should ensure that students maintain the level they have reached and that as little as possible of the knowledge already acquired is lost.

Successful completion of the assessment after the third module entitles the student to take the final examination, which is conducted by external examiners. The theoretical part of the examination takes place exclusively in digital form. Each participant receives a selection of individual questions that are randomly generated by the learning management system. "We just tell the system which pool to take the tasks from so that the level of difficulty is the same for everyone," said Lugauer. The tasks, however, are different, so copying from the neighbour

is not much use. This is also an innovation compared to the old concept.

Another change concerns the grouping of individual topics in theory lessons. "Before, we trained based on micro-topics. Radar technology, radar procedures, phraseology – a separate instructor was responsible for each topic," said Lugauer. "In the new concept, we bring everything together thematically." In future, the student will learn everything about the instrument landing system from a single source – radar and technical aspects, handling strips, phraseology. This also meant a change for the instructors, who had to familiarise themselves with new topics. "Our staff had to get out of their comfort zone for the change," said Lugauer.

Trial and error welcome

Something else is different compared to the old concept: Under the previous course model, each exercise was graded. With 45 exercises, the students effectively had 45 small and micro exams. "This made them feel they were being permanently tested for over six months," said Lugauer. In the new course, the exercises are not graded, with the exception of the assessments at the end of each module." The students are encouraged to try things out and make mistakes in order to understand air traffic control. I don't want them to just take the middle ground to pass the exam without really understanding why." For Lugauer, this is the essence of the competence orientation: Students

know how to apply something and why, and can transfer it to a new situation. After each exercise on all five working positions, there is a debriefing which takes up the same amount of time because alternatives can be tried out.

The 36 instructors who are part of Lugauer's division played the biggest role in developing the new concept. They tinkered with it for a year and a half and mastered the double burden involved, namely teaching under the existing model while working on the new concept. The 24 simulation assistants provided additional support in creating and testing new exercises. "They all deserve the greatest respect and my sincere thanks for this," said Lugauer. He also has a thank-you for the Bundeswehr: "They supported us with teaching staff, which gave our people time for conceptual work."

The first course under the new concept began in May 2022; the old system of teaching expired in July 2022. Of the 16 participants in the model course, 12 passed the training. In the second course, which started four months later, 11 of 15 participants are still there after the second module, a good number for Lugauer. How the new concept will prove itself in practice can only be assessed at the end of 2024 when the graduates of the first course complete their practical training. "It really does help the Bundeswehr if we can send them more successful graduates per year."

–Holger Matthies–



Norman Lugauer heads the training for air traffic control and simulation.

At the working position of the future

iCAS II, an air traffic control system of the latest generation, is in operation at the DFS control centre in Munich. The 350 air traffic controllers have been handling air traffic from a new operations room built especially for the purpose. They are now using one of the most modern functional platforms worldwide.

The DFS control centre in Munich, which monitors a section of lower airspace up to an altitude of about nine kilometres, has started using the new air traffic control system iCAS. iCAS is based on the 4D trajectory concept, which means that the system very precisely calculates the further flight path for each aircraft in three-dimensional space, supplemented by the fourth factor, time, to ensure an efficient flow of traffic. Air traffic controllers are alerted to potential conflicts between aircraft at an early stage, allowing their efficient resolution. Another significant innovation is that the calculated trajectories are no longer output as digital flight progress strips at the controller working positions but are displayed directly on the radar screen.

"iCAS is our answer to the Digital European Sky. It enhances the technical interplay between European air navigation service providers. It provides precise flight path calculations, an expanded human machine interface and additional functions, all of which allow our air traffic controllers to deliver proactive, advanced air traffic management," explained Dirk Mahns, Chief Operating Officer (COO) on the DFS Executive Board. DFS is the first air navigation service provider in Europe to use iCAS II, an air traffic control system of the latest generation, in one of the most complex airspaces in the world.

The new iCAS system generation was developed in cooperation with the Dutch air navigation service provider, LVNL, and the Spanish technology company INDRA over a period of about six years and subsequently introduced within six months. The DFS

branch in Karlsruhe, which monitors upper airspace, has been working with the first iCAS generation for more than five years.

The complexity behind a system introduction

The project was officially launched in February 2014. Shortly before, DFS had completed the new building at the Munich site. Air traffic control moved into this building with the system change, which meant it was possible to switch from the old to the new system without sacrificing technical and operational stability.

The COVID-19 pandemic and problems with software release planning forced DFS to postpone the commissioning date until spring 2023. A comparison shows how complex the programming of an air traffic control system is: A single programmer would have needed around 120 years to develop the complete iCAS software, without sleep and without breaks.

In the night from 18 to 19 March, the new iCAS II air traffic control system went into operation.

–Arved Saur–



Air traffic controllers in Munich at their new workplace.
Photo: DFS

We love flying

Many DFS employees are passionate about aviation in both their work lives and their private lives. *transmission* portrays some colleagues who are fascinated by the world of aviation in all its facets. In this issue, we start off with a portrait of a pilot from the German Air Force, the Luftwaffe. Learn how one pilot accumulated 4,500 flying hours in a variety of combat aircraft.

Smashing it

Lieutenant Colonel Markus K., call sign SMASH, is Commander, Flying Group, 31 Tactical Air Wing Boelcke. That means he is in charge of flight operations at Nörvenich Air Base in North Rhine-Westphalia and is the chief Eurofighter pilot there.

"I lead a flying group with two squadrons," Markus K. summed up his task as commander. This includes an air traffic services squadron, their version of air traffic control, and support personnel. Around 200 soldiers and civilian employees are under his command. "Working on all kinds of different tasks and with all kinds of different people, in addition to being a pilot as a profession, is tremendous fun," he said. Staff planning, meetings, conference calls: The commander has a variety of administrative tasks. "But the fascination and the enthusiasm for flying is always front and centre."

Three to four times a week, the chief pilot sits in the cockpit. In addition, he shares his flying experience with junior pilots as a flight instructor. And Markus K. has plenty of experience. After completing his flight training in 1996, he started as a Tornado pilot with the fighter bomber wing 32 ECR in Lechfeld in the south of Germany. After three years as an instructor on the T-38 training aircraft at Sheppard Air Force Base in Texas and then further time on the Tornado, Markus K. was given the unique opportunity to fly an aircraft type that is not part of the



Bundeswehr inventory: "In 2009, my commander at the time asked me if I was interested in flying F-16s," he said. He was to be trained on the fighter jet of the United States Air Force as part of an exchange programme, and even to become a flight instructor. "I thought I had won the lottery at the time."

Markus K. spent three and a half years at Luke Air Force Base in Phoenix, Arizona, and returned to Germany in 2013 as a trained

F-16 pilot, which benefitted him in his further career. "The role of the F-16 is very similar to the role of the Eurofighter," he said. "A single-seat, multi-role combat aircraft with air-to-air and air-to-ground capability combined into one weapon system." This was followed by retraining on the Eurofighter, the third aircraft type in his flying career, which he has been flying as a pilot and flight instructor since 2013.

He has accumulated around 4,500 flying hours in his career, about twice as many as is usually the case for Bundeswehr jet pilots. His flight time is also impressive because Markus K. did not actually intend to become a jet pilot. He first applied to the Bundeswehr to become a helicopter pilot. "When I was 16, I had the opportunity to fly in a helicopter," related the commander. "That was the *Herzblatt* helicopter, from the TV show with Rudi Carrell at the time." After take-off from what was then Munich Riem Airport, the pilot handed over the controls to Markus K. with the announcement that he should follow the A9 motorway and fly to Nürnberg. "I was so proud to be piloting an aircraft that I decided to become a pilot that day." Markus K. grew up in the Munich area and was able to view first the Starfighter and later the Tornado in low-level flight in his hometown.

After leaving upper-secondary school, he applied to the German Armed Forces, the Bundeswehr, and had to do the airworthiness examination. After he had passed this, the aeromedical examiners suggested another career to him. "They told me I could also fly combat aircraft with an ejection seat," he said. The demand for jet pilots was higher then, and so was the salary. "The decision was not difficult for me."

Almost 30 years later, the commander looks back on an eventful career and many memories. "What comes to mind off the top of my head is when I was able to climb to 53,000 feet in the F-16," he said. That's more than 16 kilometres above sea level and more than three kilometres higher than a passenger aircraft is travelling at cruising level. At this altitude, the tropopause begins,

the transition from atmosphere to stratosphere. "There, the sky is dark at noon and looking towards the horizon you can see that the earth is not a disc," the commander told us.

Life-threatening situation

Thinking of high altitudes, however, Markus K. also remembered an incident that put him in a life-threatening situation. "I had a slow pressure drop in the cockpit at 36,000 feet, coupled with a faulty oxygen supply," he said. This can lead to unconsciousness within a few seconds. "In this situation, pilot training saved me," he said. This is because during military training student pilots experience the symptoms of oxygen deprivation, which are different for each person, in a negative pressure chamber, where such a pressure drop is simulated. "I had a feeling of warmth in my thigh and recognised this symptom," he said. He then switched on the emergency oxygen supply and was in full possession of his faculties again within a few minutes.

"Military flying is exciting, but also risky, because we fly manoeuvres that push us to our physical limits," said Markus K., who, as a fighter pilot, flew missions in Kosovo and was deployed in Jordan as head of the task force squadron, among other things. The commander was also involved in the large-scale NATO exercise Air Defender 23, which took place in June. There, too, he initially saw risks. "I was worried about getting so many aircraft into the air in a coordinated and safe way," he said. "The exercise involved 60 or more aircraft flying simultaneously in European airspace and acting together tactically." This was an enormous coordination effort on the part of the Bundeswehr and participating partners. "The support from DFS and Maastricht UAC was phenomenal. We had a super airspace structure of military training areas during the exercise."

He cannot give a clear answer to the question of whether he could imagine flying another weapon system, namely the F-35, which the Bundeswehr will introduce in the coming years. "Of course, I would like to do it,

however, it is unusual in the role of commander to retrain on another weapon system," Markus K said. At 48, he is well past the average retirement age for jet pilots, which is about 40.

Incidentally, the commander's call sign, SMASH, is an American acronym. "Call signs are usually based on a humorous story about the pilot," he said. However, he did not reveal the story behind his call sign.

–Sven Chamberlain–



Nils Becker (2nd from right), Timon Buchmüller (2nd from left) and Philipp Jander (right) with their colleagues.

Nils Becker, Timon Buchmüller and Philipp Jander love flying, and love working at the DFS Aeronautical Information Service Centre (AIS-C). A trip to the tiny Danish island of Vejrø challenged their flying skills.

The three AIS officers are united by their passion for flying. Last July, the private pilots flew with four other colleagues in two small planes to the tiny Danish island of Vejrø in the Baltic Sea. Nils Becker and Timon Buchmüller had chartered a Robin DR400 from their flying club FSC Aschaffenburg. Philip Jander flew with a Cessna 172 from the DFS Flying Club. The two groups started from Egelsbach and Aschaffenburg

aerodromes and then met at the first stop in Braunschweig. "There, the weather looked pretty bad," said Philipp Jander. Several thunderstorm cells were moving from west to east over northern Germany.

Strong wind

After an extensive weather briefing on the ground, the group decided to continue flying only as far as Lübeck after taking off from

Braunschweig. The special thing about this flight was that the two small aircraft flew as a formation, which was a new experience for the private pilots. In Lübeck, the seven then decided to attempt the approach to the island, despite a wind speed of 30 knots. "But our luck was in, and the wind came directly from the front during our approach to land," Jander stressed. "It was easier than I had imagined."

The plan was to fly to Hamburg the next day after a night in the hotel on Vejrø. But things turned out differently. The seven DFS colleagues woke up to a violent storm lashing the waves against the coast. It was also raining heavily. The weather forecast for Hamburg was also miserable. A hurricane-force storm was passing over northern Germany. Still, staying on the island was not an option. The grass runway threatened to become too wet for a take-off. "We might not have been able to get away for days," said Nils Becker describing the situation. The seven finally took off in a strong crosswind for a very bumpy flight to Maribo, a few kilometres away, where a large aerodrome with a long, wide runway made a safe landing possible. The top of cloud was at 1500 feet and the flight only took about 15 minutes.

A flight to Hamburg was still out of the question. "We passed the time in the hotel instead," said Timon Buchmüller. The return flight the next day to Aschaffenburg and Egelsbach via Kassel or Paderborn was unspectacular. "It was an exciting journey. At no time was it dangerous," Jander emphasised. After all, the seven DFS staff members had prepared intensively.

The pilots:

Nils Becker grew up in Cape Town, South Africa, where he emigrated with his mother at the age of four. He already had his private pilot licence under his belt at the age of 17. "My mother always had to take me to the airport because I was not yet 18 and therefore not allowed to drive myself," the 31-year-old recalled. He knew he wanted to be a pilot when he was a little boy. The private pilot licence (PPL) was followed by the

commercial pilot licence with instrument rating (CPL IR). But a career as a commercial airline pilot was not an option for him because of the poor working conditions at many airlines. "I didn't see a future in professional aviation." In South Africa, he flew banner ads along the beach for a company and helped out in sales before deciding he would rather live in Europe again. Initially, he spent three years in England before returning to his native city of Frankfurt, where he initially worked as a simulation pilot at DFS. In 2019, Nils then began his training as an AIS officer. He had his commercial pilot's licence from South Africa downgraded and converted to a European licence, so that he now flies only as a private pilot. "I am not enthusiastic about flying single-engine aircraft under instrument flight rules anyway," he said. The married father of a three-year-old daughter has 530 flying hours, including over 250 on the Piper Super Cub.

Timon Buchmüller was born in Mülheim/Ruhr and grew up in Kassel. During a holiday on the island of Sylt, he took a sightseeing flight with his parents. From then on, it was clear to the then eight-year-old that he wanted to learn to fly. At the age of 14, he acquired his sailplane licence. His cousin, an airline pilot, advised him against becoming a commercial airline pilot because the working conditions were often difficult. As an alternative, he then applied for air traffic controller training at DFS after graduating upper secondary school. He was not successful in the test at the German Aerospace Centre (DLR) in Hamburg, but DFS offered him the training to become an AIS officer in 2019 after a positive assessment. "Until then, I hadn't even known what AIS officers actually did." When, because of the COVID-19 pandemic, training was mainly online and he had more time as a result, he started his private pilot's licence in 2020. He and his colleague Nils Becker are in the same flying club and often fly together. On the trip to Vejrø, they took turns at the controls. Timon Buchmüller has 80 flying hours.

Philipp Jander grew up in Thuringia. He often flew on holiday with his parents. That's why

he found aviation exciting even as a young boy. At the age of 14, he received the Microsoft flight simulator as a Christmas present and was completely hooked, spending hours flying virtually on the computer. It was clear to him that he would train as a private pilot as soon as possible. After graduating upper secondary school, he began a specialist commercial apprenticeship in the aviation sector in Berlin. In 2014, he had successfully completed his PPL and worked at Berlin Airport as a marshaller, where he also met his current wife. Both then applied for jobs as apron controllers at Frankfurt Airport. When only his wife got the job and he did not want to have

a long-distance relationship, Philipp Jander remembered DFS. Shortly after leaving school, he had taken the air traffic controller test without success. Even then, DFS had asked him if he was interested in another in-company training. He asked whether this offer was still valid. He was then able to start training as an AIS officer in 2018. Shortly afterwards, he joined the DFS Flying Club. The 32-year-old has 220 flying hours.

–Sandra Ciupka–



Best possible traffic system for drones

DFS and Droniq have completed the LUV project as part of a consortium. This project, funded by the German Federal Ministry for Digital and Transport (BMDV), has been running since the beginning of 2022 and the project group has developed solutions and recommendations for action for the implementation of the U-Space regulation.

The U-Space regulation came into force at the end of January 2023 and is mandatory for EU Member States. The European Commission has created a legal basis for the design of U-Space airspaces. However, when it comes to the concrete design – such as the responsibilities, the processes and the interaction of the actors in a U-space airspace – it leaves the Member States considerable freedom in some cases.

The LUV project supports the BMDV as legislator and the competent local authorities in making the best possible use of this freedom of design as part of the national implementation.

LUV showcases design options

The DFS subsidiary Droniq played the role of the so-called U-Space Service Provider (USSP) in the project. As a direct interface to the U-Space user, the USSP is responsible, among other things, for drone flight permissions and the provision of airspace information and a display of the air situation with manned and unmanned aircraft in the vicinity of the drone. The information required for these services was provided by DFS as the central provider of common information services, the so-called Single Common Information Service Provider (S-CISP).

Whether an S-CISP is established or not is left open by the U-Space regulation. The project results have shown that establishing such a central information service provider leads to more safety and efficiency. In addition, U-Space airspaces are likely to overlap with

controlled airspaces. Then parts of the U-space airspace will fall under the responsibility of DFS as the superordinate air navigation service provider in Germany. In this context, recommendations for the design of a dynamic reconfiguration have been developed. Dynamic reconfiguration means the short-term activation and deactivation of U-Space airspaces.

The LUV consortium also examined possible pricing models for the S-CISP and the USSP on the basis of economic feasibility analyses and carried out an evaluation for future traffic scenarios using simulations.

Lead market for drone applications

The project group submitted the recommendations for action to the German Federal Ministry of Digital and Transport in April. In the upcoming national legislative process, these recommendations should help to establish Germany as a lead market for drone applications and thus support the Federal Government's action plan on unmanned aircraft systems and innovative aviation concepts.

In addition to DFS and Droniq, the project participants were the BMDV as the funding body, Helmut Schmidt University/University of the Federal Armed Forces Hamburg as the consortium leader, the Ministry of Economics and Innovation of the Free and Hanseatic City of Hamburg, HHLA Sky GmbH, HafenCity University Hamburg and Hamburg University of Technology.

-Editorial Team-



The LUV project group with representatives of all partners at the conclusion of the project. Photo: DFS



The EMAS certificate was presented by Kirsten Schoder-Steinmüller (DIHK).

DFS introduces EMAS environmental management system

DFS was the first comparable air navigation service provider in Europe to introduce a certified EU environmental management system in accordance with the demanding EMAS regulation. EMAS stands for Eco Management and Audit Scheme.

Fewer CO₂ emissions, lower consumption of resources, less waste, less energy, and more biodiversity – these are some of the fields of action of corporate environmental and climate protection at DFS. To make the environmental success measurable and to continuously improve our position, DFS has certified itself under EMAS (registration number: DE-160-00018). Kirsten Schoder-Steinmüller, President of the CCI Hessen (HIHK), an umbrella organisation of the 10 Hessian chambers of industry and commerce, presented the EMAS certification certificate to DFS CEO Arndt Schoenemann. In Germany, the chambers of industry and commerce are the notified bodies for the registration of companies in the German and European EMAS registers.

DFS focuses on decarbonisation and green power

During the 18-month EMAS preparatory phase, important measures for reducing CO₂ and decarbonisation could already be implemented. From 2024 onwards, DFS will rely on green power at all locations except its Headquarters in Langen. More precisely, it will be using a so-called power purchase agreement, or PPA. Under a PPA, DFS agrees to binding, long-term electricity sourcing with a green power producer, amounting to about 42 gigawatt hours (GWh) per year. This is the volume of electricity consumed by about 11,000 four-person households. DFS is thus already reducing its CO₂ by 50 percent. DFS is also making itself independent of fossil fuels by replacing gas heating systems with heat pumps and district heating at the control centres and towers. To cover its own electricity needs, DFS is also investing in photovoltaic systems. A solar power system

is currently being commissioned on the roof of the Bremen control centre, and other locations are already being examined. The company's vehicle fleet is also being electrified step by step and DFS is building its own e-charging infrastructure at suitable locations.

Renaturation and climate-friendly mobility

Two thirds of the approximately 130 hectares of land used by DFS for facilities and buildings nationwide are already unsealed. DFS is creating even more living space through the targeted renaturation of vacant areas and green roofs. Climate-resistant trees and insect-friendly bushes were planted to promote biodiversity at the Langen site. To reduce the CO₂ emissions stemming from all forms of corporate mobility purposes, DFS has been offering a subsidised *Deutschlandticket* since May 2023. This ticket means members of staff can use local and regional public transport across the whole of Germany with one ticket. In addition, DFS offers a tax-incentivised 'job bike', which benefits both the environment and the health of employees. Every sixth employee already takes advantage of the job bike programme.

"We want to do everything we can with the means at our disposal to minimise the climate-damaging effects of our business activities. EMAS offers us an excellent instrument for this. For the future, we should also be able to systematically record our contributions to the CO₂ emissions from German air transport, select measures, and track these to make our progress measurable," said Arndt Schoenemann, CEO and Chairman of the Executive Board.

–Editorial Team–

Arndt Schoenemann remains CEO of DFS

The Supervisory Board extended his contract until 2029. He took on his position as CEO on 1 April 2021.

"I am delighted that in Arndt Schoenemann we have a company leader who has a clear vision of the future and who will continue to advance the company; one who keeps the interests of DFS, its employees and its customers in mind," said Antje Geese, Chairperson of the Supervisory Board. "I am all the more pleased that we on the Supervisory Board have clearly endorsed his work so far and that he will continue this work for another five years. By extending his contract at this early stage, we want to send a signal that progressing

the company, while maintaining continuity and dependability, are equally important to us."

The contracts of the Executive Board members Dirk Mahns (Chief Operating Officer) and Friedrich-Wilhelm Menge (Chief Technology Officer) run until 2028. The Chief Human Resources Officer, Andrea Wächter, was appointed for three years as of November 2022.

–Editorial Team–

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