



Federal Supervisory Authority
for Air Navigation Services

Annual Report 2019/2020

Numbers, Data, Facts

Report of the Federal Supervisory Authority for Air Navigation Services



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Word of Welcome

Dear readers,

this double annual report is special because August 2019 marked the 10th anniversary of the Authority's establishment – a decade of supervision for safe, orderly and smooth air traffic. We were faced with the challenge of establishing a new authority and developing supervisory activities in civil air navigation services. The separation of supervision and operational air traffic services has improved the overall system. We can be particularly proud of the cooperation and close coordination we have developed with our European neighbours. In retrospect, it can be said that these challenges have been met, but the challenges associated with implementing the Single European Sky are by no means smaller. With the EU's future SES II+ package, we will be challenged, but also spurred on to find viable solutions in Europe for the future.

The year 2019 was also marked by a constant increase in aircraft movements, which pushed the air traffic management system in particular to its limits. What no one suspected was that air traffic plummeted by 80% at the beginning of 2020 as a result of the Corona pandemic and has since then remained at a historically low level from which it will not recover in the short term. Over the past two years, the Federal Supervisory Authority for Air Navigation Services (BAF) has thus seen how the aviation industry can go from one extreme to the other.

With the onset of the Corona pandemic, the BAF has had to adjust its supervision to the more difficult circumstances. Air navigation services have also adapted themselves dynamically to the new conditions. Nevertheless, there are some legal requirements that are difficult to fulfil under the given circumstances. Among other things, the BAF has therefore issued process adjustments, which allow individual exceptions for air traffic control personnel to a limited extent. For the most part, supervision thus took place digitally or remotely rather than on site.

With regard to technical air traffic services facilities, a major breakthrough occurred in how the generation of wind energy affects air traffic control. Since the beginning of June 2020, the DFS Deutsche Flugsicherung GmbH (German Air Navigation Services) has been using a new method in its calculation of possible disturbances. This method was developed by the Federal Standards Laboratory (Physikalisch-Technische Bundesanstalt/PTB) as part of the WERAN project. The results of new calculations show that the BAF can probably approve more wind turbines in the protection areas of omnidirectional radio beacons.

On 31 October 2020, the new Berlin-Brandenburg Airport (BER) opened. When the southern runway was put into operation on 4 November 2020, the flight procedures for BER also became effective. Since the flight procedures were first defined in 2012, there have been many court cases which, however, did not produce any ruling to rescind or alter them so that the approach and departure procedures in the vicinity of the airport did not have to be changed until the opening. The BAF has thus made its contribution to this major project.

As for the BAF itself, there has been a change of directors as of 2 November 2020 when Dr. Karsten Baumann took up his post in Langen. His appointment ensures the constant and outstanding leadership required in these unusual times. But read for yourself what else the BAF has had to deal with in the past two years!

Europe and Air Traffic

European Regulations and Developments

The work of the Federal Supervisory Authority for Air Navigation Services (BAF) is based on the regulations of the European Union (EU) pertaining to the creation of the Single European Sky (SES), which came into force in April 2004. Essentially, these regulations focus on

- The creation of joint airspaces across national borders,
- The uniform certification of air navigation service providers in Europe,
- Improving the interoperability of air navigation services systems,
- Intensifying civil-military cooperation,
- Increasing capacity while maintaining safety standards and
- Avoiding delays and, consequently, increasing punctuality.

The programme for the creation of the Single European Sky was expanded in 2009 by the so-called SES II package, which contains some additional elements. Thus, a pan-European system of performance planning for air navigation services was introduced. The task of air traffic flow management, which had already been carried out by EUROCONTROL, was expanded into a comprehensive network management and the establishment of transnational functional airspace blocks (FABs) was made mandatory. Moreover, the tasks of the European Union Aviation Safety Agency (EASA) in Cologne have also been extended and now include safety regulations in air navigation services.

In the autumn of 2020, the European Commission took a further step towards the realization of the Single European Sky by introducing the so-called SES II+ Pact. The Commissioner for Transport, Adina Vălean, presented the guidelines of the SES II+ regulation in a press conference on 22 September 2020. In this press conference, the Commissioner highlighted the difficulties faced by the aviation industry.



Commissioner Adina Vălean at the SES II+ press conference in Brussels

Source: European Commission, Jennifer Jacquemart

In this regard, she mentioned both the past years of steady traffic growth and the collapse of traffic due to the Corona pandemic since the spring of 2020. Between these two extremes, the Commission wants to better position the air transport system in the future and systematically address the associated problems.

Afterwards, the Commission presented the draft text for the new edition of SES II+ as well as a strategy paper on it. The new regulations planned therein would massively affect the work of the BAF. For example, a separation of the national supervisory authority (NSA), which is responsible for economic oversight, and the competent authority for aviation safety (CA) is proposed. To this end, a separate economic certificate is to be introduced.

In addition, the terminal and enroute areas shall be separated with regard to performance planning. Here, the national supervisory authority shall only be responsible for performance planning in the terminal area and a new Performance and Review Body (PRB) embedded in the EASA is to be established, which would be responsible for performance planning in the enroute area. Currently, the PRB is an advisory body to the Commission and national supervisory authorities with regard to the implementation of performance targets and plans.

At present, it is not yet possible to judge whether and in what precise form these plans will become reality. What

seems certain, however, is that the Single European Sky system will continue to evolve and that the challenges of the future will be addressed in the context of this system.

Participation in European Bodies on Air Traffic

The BAF is involved in many bodies of the European Union at various levels. This is done either via the Federal Ministry of Transport and Digital Infrastructure (BMVI), which draws on the technical expertise of its subordinate federal authorities, or through BAF staff who participate directly in meetings of European committees. There, they advocate technical solutions, which are then implemented through regulations issued by the European Commission. In this context, coordination between the European supervisory authorities is important, both directly and within the framework of the functional airspace blocks (FABs).

Bodies of the European Commission

Single Sky Committee (SSC)

The Single Sky Committee (SSC) is the committee that assists the European Commission with implementing the Single European Sky (SES) regulations. Its meetings are attended by the representatives of the member states. Germany is represented by the chief of the competent specialist branch of the Aviation Division of the Federal Ministry of Transport and Digital Infrastructure (BMVI), who is usually accompanied by the director of the BAF. Other participants include a representative of the Federal Ministry of Defence (BMVg) and a representative of the Federal Office of the Bundeswehr for Military Aviation (LufABw).

In 2019/2020, it was in particular the planning of services and charges for reference period 3 (RP3) that was intensively discussed on the SSC. Furthermore, the SESAR Common Projects and the revision of the Pilot Common Project Regulation No. 716/2014 (so-called PCP Regulation) were also the subject of the consultations.

EASA Committee

With the new version of the Regulation on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, the so-called basic Regulation, Regulation (EU) 2018/1139, some topics of air navigation services were removed from the SES regulations and integrated into the basic Regulation. As a result, these topics are no longer dealt with on the SSC but on the EASA Committee (EASA-C). This committee takes care of the application of common rules in the context of civil aviation safety issues. Here, too, the BAF is now involved and participates in the meetings alongside the voting representation of the Federal Ministry of Transport and Digital Infrastructure (BMVI).

At the EASA-C, for example, the European Risk Classification Scheme, which is used to classify aviation incidents, was on the agenda in 2019 and 2020. In addition, the regulatory framework for U-Space was addressed as the area in which the operation of unmanned aerial vehicles should be possible.

NCP Plenary

At the NCP Plenary, the directorates of the supervisory authorities of all European member states as well as neighbouring states with observer status meet with the European Commission. The plenary meetings discuss strategic issues that are of interest to all supervisory authorities or that provide direction for the National Supervisory Authorities Coordination Platform (NCP). The host is always the national supervisory authority of the member state holding the Presidency of the Council of the European Union at the time of the meeting. In the second half of 2020, this was Germany.

Thus, a two-day event with a supporting programme should have taken place in Frankfurt a. M. in mid-November 2020. However, due to the renewed increase in COVID-19 infection figures throughout Europe at that time, it was not possible to hold a face-to-face event. Therefore, a video conference of the European supervisory authorities and neighbouring states with the European Commission took place on 16 November 2020. Owing to

the fact that it was a digital video conference, the available time was greatly reduced and the overall event was packed with information. At the beginning, the new Director of the BAF, Dr. Karsten Baumann, briefly introduced himself to the other member states and the Commission. The discussions focused on the restructuring of the NCP with only two working groups. The Commission gave a progress report on this, which was the subject of lively discussion afterwards. The topic of SESII+ was also discussed controversially.

NCP Working Groups

In October 2019, a restructuring of the NCP Working Groups (WGs) was decided at the 15th meeting of the National Supervisory Authorities Coordination Platform (NCP).

As a result, the NCP Safety Oversight WGs were transferred to the EASA and a "Transversal" WG was established, combining the NCP WGs on FAB, IOP and SESAR. Only the NCP Performance WG has remained unchanged. It is planned that the NCP IOP WG will also be adopted by the EASA in the future.

The BAF participates in the meetings of the Working Groups with its experts from the respective technical branches.

Transversal Working Group

The topics discussed in the NCP Transversal WG included regular updates on SESAR developments and its implementation as well as the work of the SESAR Deployment Manager. Additional topics were also on the agenda, for example:

- The further alignment and merging of the ATM Master Plan Level 3 Progress Report and the SESAR Deployment Monitoring,
- A discussion about the repercussions of the recommendations from the Airspace Architecture Study (AAS) and the Wise Persons Group (WPG) Report on the work of the supervisory authorities as well as

- The subject area of drones and
- The impact of the COVID 19 pandemic on the implementation of the SESAR.

Another important issue that the Transversal WG dealt with was cooperation between the supervisory authorities, which led to discussions about best practice approaches in the work of the national supervisory authorities.

Bodies within the Framework of the FABEC

Safety oversight is unthinkable without international cooperation and participation. What is of central importance here are the agreements and joint working structures and procedures within the framework of FABEC with the supervisory authorities of Switzerland, France, the Netherlands, Belgium and Luxembourg. Equally important is cooperation with the EASA in the context of its advisory and regulatory groups. Here, one member state at a time chairs the general organisation and the external representation. In 2019, the chair was held by Luxembourg and in 2020 by the Netherlands.

NSA Committee

The chairmanship of the NSA Committee, the committee of supervisory authorities of the FABEC, was taken over in November 2019 by the head of the SOP branch (Safety Oversight of Air Navigation Service Providers and Personnel) at the BAF, Karsten Tilenda, following a unanimous election. Mr. Tilenda had already been acting head of the committee since April 2019.

The FABEC NSA Committee has set itself the goal of harmonizing the supervisory functions, processes and tasks in all six states to the greatest possible extent and to execute them with jointly defined measures. Its main fields of activity are:

- The risk-based oversight planning and execution with the joint FABEC Extract of the Oversight Programme (FEOP)

- The Change Task Force with its standardized processes in the area of notification, review and approval of safety-relevant changes of air navigation service providers and
- The Safety Performance and Risk Coordination Task Force (SPRC), which coordinates in particular the states' safety management and performance oversight obligations.

HAC

The Head of the LFR Branch (airspace, flight procedures and law) at the BAF, Wolfgang Ruths, has been Vice-Chairman of the FABEC Harmonisation and Advisory Committee (HAC) since 2018. The HAC was established under Article 26 of the FABEC Treaty. It assists the FABEC Council in the implementation of Article 10 (Harmonisation of rules and procedures of the Contracting States) and Article 12 (Community designation of air traffic service providers in the airspace concerned) of the FABEC Treaty. The HAC carries out other audits - in particular legal audits - delegated to it by the FABEC Council. Due to a planned absence of the chairperson, Wolfgang Ruths led the HAC on an interim basis in 2020. One important topic was the legal consultation on the EU's SES II+ package.

FPC

The Financial and Performance Committee (FPC) is responsible for performance planning and subsequent monitoring. Here, the BAF is represented by the head of the WA Branch (economic oversight), Mathias Jürgen Schallnus. In 2019 and 2020, the focus was on preparing performance planning for the third reference period (RP3) and developing measures and legal regulations to deal with the aviation crisis triggered by Covid-19.

Cooperation with Neighbouring Countries

The regular exchange of information with the air traffic services supervisory authorities of neighbouring countries has become firmly established and makes an important contribution to the realization of the SES.

Trilateral Meeting with Austria and Switzerland

The annual trilateral meetings with the supervisory authorities of Austria and Switzerland have proved their worth. On 20 and 21 March 2019, the BAF and its Austrian colleagues visited the Swiss Federal Office of Civil Aviation (Bundesamt für Zivilluftfahrt/BAZL) in Bern. The meeting provided a very good opportunity for an intensive exchange of information and coordination with the neighbouring countries. What was discussed among other things was how to harmonize and align supervisory activities if air navigation service providers offer their services across borders. Another topic was the exchange of radar data according to Regulation (EU) No 1207/2011. With regard to protecting the radar frequency spectrum, it was also discussed how to find a transnational solution for the problem of secondary radars being overloaded by too many interrogations.

The meeting planned for 2020 was postponed due to the Covid 19 crisis and held as a video conference on 28 January 2021. The focus was on the provision and oversight of aerodrome flight information services (AFIS), the challenges in the context of unmanned aircraft systems (UAS) and the exchange of experience with regard to EASA inspections.

New Administrative Agreement with Croatia

The BAF maintains good relations with the Croatian Civil Aviation Authority. These have been consolidated by a joint administrative agreement in the field of air traffic management. It was signed in Zagreb at the headquarters of the Croatian Civil Aviation Supervisory Authority on 3 June 2019 by the Director of the BAF, Prof. Dr. Nikolaus Herrmann and Marin Puh, Head of the Croatian Civil Aviation Authority.

New Administrative Agreement with Georgia

Based on the EU's "Twinning" project with Georgia, a lively exchange has developed between the Georgian Civil Aviation Authority and the BAF. "Twinning" projects

are transnational partnership projects on behalf of the European Commission. The intensive communication resulted in a cooperation agreement between the two national supervisory authorities in the field of air traffic management and air navigation services (ATM/ANS). On 18 October 2019, the Director of the Civil Aviation Authority of Georgia, Levan Karanadze, and the Director of the BAF, Prof. Dr. Nikolaus Herrmann, ceremonially signed the agreement on behalf of both contracting parties in Georgia's capital Tbilisi.



Levan Karanadze (left) and Prof. Dr. Nikolaus Herrmann (right) at the signing ceremony in Tbilisi
Source: Prof. Dr. Nikolaus Herrmann

Update of the Administrative Agreement with the Czech Republic

Within the framework of the regular bilateral meetings that the BAF holds with the supervisory authorities of the neighbouring states, the supervisory authority of the Czech Republic and the BAF determined that the application of Implementing Regulation (EU) 2017/373 in particular required an update of the joint agreement on the cooperation of the two authorities in the area of ATM/ANS. At the bilateral meeting in Langen in November 2018, the parties therefore analysed the provisions of the Regulation and identified the need for change. In addition, the authorities took the opportunity to extend the cooperation agreement to training organisations. The proposed amendments were drafted and finalised at the bilateral meeting in Prague in July 2019. The signing took

place during the ceremony for the 10th anniversary of the BAF in Langen's town hall on 14 August 2019, where the BAF welcomed the Czech colleagues as guests.



The guests from the Czech Republic after the signing of the administrative agreement in Langen (from left to right: Jaroslav Pekárek (NSA CZ), Eva Julia Ramos Breilich (BAF), Josef Kopp (NSACZ), Prof. Dr. Nikolaus Herrmann (BAF), Bianka Schwarze (BAF))
Source: BAF

U-Space and Drones

In terms of unmanned aviation, there has been a particularly large amount of news in 2019 and 2020. Drones offer significant opportunities for business and the society at large. However, their safe integration into airspace also poses a major challenge.

In mid-2019, the Deutsche Flugsicherung GmbH (German Air Navigation Services) was tasked with the systematic detection of unmanned aerial vehicles. A drone detection system is to be developed and introduced to ensure the safe, orderly and smooth handling of air traffic at the 15 major airports. In its capacity as supervisory authority, the BAF assists the Deutsche Flugsicherung with this new task.

In addition, the development of a "high-level regulatory framework for the U-space" has begun at European level. The aim is to establish areas for the operation of unmanned aircraft systems (UAS) and to introduce the

services necessary for UAS operations. Furthermore, the coordination and interaction with manned aviation and, in particular, with the air navigation services for manned aviation shall be regulated.

In October 2019, the EASA published a first draft regulation ("Draft Opinion"), which was then followed by the first official draft regulation ("Opinion") in March 2020.

Since February 2020, the draft regulation for the regulatory framework for U-Space and the accompanying draft regulations have been regularly discussed on the EASA Committee (EASA-C), the comitology committee based on Regulation (EU) 2018/1139. Through its participation in the EASA Committee, the BAF is involved in this legislative process and evaluates the planned regulations from the perspective of air navigation services (cf. also the chapter "Frequency Management").



Swarm ascent of drones (Yuneec, DJI drone) during the DFS test for a drone detection system at Frankfurt Airport
Source: DFS Deutsche Flugsicherung GmbH

Excursion: COVID-19 and Air Traffic

The pandemic with the novel SARS-CoV2 virus has had Europe and the world firmly in its grip since the spring of 2020. The impact on the BAF has affected all areas, so that it has had a lasting effect on the BAF's work. The excursion provides a brief overview of the impact on the activities of the supervisory authority in the first year of the pandemic.

Corona-Related Exemptions for Air Traffic Services Personnel

Developments in Germany and Europe with regard to the Corona SARS-CoV2 virus have been very dynamic in the course of 2020 and remain difficult to predict. Air navigation services have also adapted themselves to the new conditions. Nevertheless, there are some legal requirements that can only be fulfilled irregularly under the given conditions. For example, licences and unit endorsements of air traffic services personnel must be reissued or renewed on a regular basis. In order to guarantee the system of air navigation services supervision as well as the continuity of services despite the restrictions that a worldwide pandemic entails, it was necessary to work with temporary arrangements.

The BAF has therefore enacted new or updated general rulings several times, which have adapted the applicable regulations to the current status. This means that it was and still is possible - to a very limited and restrictively interpreted extent - to grant individual exemptions for air traffic control officers (ATCO) and aeromedical examiners (AME) even into the spring of 2021.

Impact on the Performance Planning Process

Due to the developments of the Corona pandemic, the performance planning process for reference period 3 (2020-2024), which had started in 2019, was already stopped in the spring of 2020. After long negotiations between the European Commission and the Member States, Implementing Regulation (EU) 2020/1627, previously endorsed by the Appeals Committee of the Single European

Sky Committee (SSC), was adopted on 3 November 2020. Based on this Regulation, the performance planning process was initiated again. A special feature was that the years 2020 and 2021 were considered together for the planning process.

Impact on the Charging Scheme

Air navigation charges are generally designed to cover all costs associated with the provision of air navigation services. The charges are generally set on the basis of a five-year plan, whereby only serious and unforeseeable circumstances lead to an adjustment of the charges for the year after next.

As a result, the serious drop in traffic in 2020 of -55.2% compared to the planning has no impact on the setting of charges in 2021. Rather, the revenue shortfalls will only be passed on to the airspace users in the form of increased charges from 2022 onwards. In contrast to the usual mechanism of taking adjustments fully into account in the year after next, it was decided, due to the extent of the revenue shortfalls for the years 2020 and 2021, to allocate them over a period of five to seven years.

Occupational Safety at the BAF during the Corona Pandemic

Occupational health and safety was dominated by the SARS-CoV-2 pandemic both at the beginning of the pandemic and throughout 2020. Even before the outbreak of the pandemic, the BAF was well equipped with regard to the IT devices for its employees as notebooks are available at all of the BAF's workplaces. Therefore, all it took was to establish a pandemic plan that allowed the employees to work at home and to adapt operations to the course of the pandemic. While the BAF also faced technical challenges, for example difficulties in forwarding a large volume of telephone calls or inadequate internet connections not designed for situations in which many users share limited bandwidths, the BAF was able to solve these problems expeditiously and in a goal-oriented way together with its employees. Here, the focus was on the interests of the

employees who made their contribution to ensure the fulfilment of the Authority's tasks under these difficult circumstances.

In cooperation with the Federal Information Technology Centre (ITZBund), it was possible to set up a web conference tool at short notice with which the BAF's work and performance could be maintained by means of video conferences. The employees were provided with the means to carry out their tasks successfully at home. What was at the forefront of efforts was reconciling professional tasks with the special situations in the families where parents had to deal with school closures due to the pandemic or other decrees issued by the federal states to combat the SARS-CoV-2 virus.

On the other hand, there were and still are tasks that can only be performed inadequately or not at all from home. Therefore, with the support of the health management in

the ZV Branch (central administration) and a crisis team, the Authority's directorate drew up a hygiene concept that was regularly adapted to the current situation. This ensured the best possible protection of our employees in the event of necessary attendances at the BAF.

The aim of all health management measures at the BAF was and continues to be a professional approach to the challenges of a pandemic. This included not only being available at short notice to answer our employees' questions but also making a commitment to provide further support. For example, offers for in-house social counselling or information on how to deal with corona-related restrictions in private and professional situations were regularly made and decrees from the lead ministries (Federal Ministry of the Interior (BMI), Federal Ministry of Health (BMG)) and other organisations (Robert Koch Institute (RKI), Unfallkassen (accident insurance funds)) were implemented.

Safety Oversight

Safety oversight is a core task of the BAF. Here, the Supervisory Authority focuses its attention on the air navigation service providers and their personnel as well as the air navigation infrastructure and technology, but also on the economic performance of the air navigation service providers.

Air Navigation Service Providers

Certification

As proof of their competence, air navigation service providers must be certified by the BAF. The services of air navigation service providers relate to

- Air traffic management (ATM),
- Air traffic services (ATS),

- Communication, navigation and radar surveillance (CNS),
- Aeronautical information services (AIS) and
- Aeronautical meteorological services (MET).

Together with the air navigation service providers that have obtained a certificate abroad and offer their services in Germany, the BAF was responsible for a total of 27 air navigation service providers and 6 training organisations in 2019 and 2020.

The enactment of Implementing Regulation (EU) 2017/373 made it mandatory that all previous BAF certificates that had been issued in accordance with the requirements of Implementing Regulation (EU) 1035/2011 be converted to the new requirements and that all previous certificates be reissued. The BAF decided to convert the certificates by the end of 2019. The certificates for the AFIS airfields were changed by the end of 2020.

Table 1a: Overview of air navigation service providers and training organisations

Air navigation service providers	Training organisations
Austro Control GmbH	Airbus Helicopters Deutschland GmbH
DFS Aviation Services GmbH	Austro Control GmbH
DFS Deutsche Flugsicherung GmbH	DFS Aviation Services GmbH
Deutscher Wetterdienst	DFS Deutsche Flugsicherung GmbH
ESPA GmbH	DFS Deutsche Flugsicherung GmbH Bereich Akademie
EUROCONTROL MUAC	Rhein-Neckar-Flugplatz GmbH
Rhein-Neckar Flugplatz GmbH	

Source: BAF

Table 1b: Overview of AFIS airfields

AFIS airfields	
Aeroclub Coburg e. V.	Flugplatz Schwäbisch Hall GmbH
Airbus Helicopters Deutschland GmbH	Flugplatz Straubing-Wallmühle GmbH
Flughafen Kiel GmbH	Flugplatzgesellschaft Schönhagen mbH
Flughafen Neubrandenburg Trollenhagen GmbH	FMB Flugplatz Magdeburg Betriebsgesellschaft mbH
Flugplatz Altenberg-Nobitz GmbH	JadeWeserAirport GmbH
Flugplatz Bautzen Betreibergesellschaft	Siegerland Flughafen GmbH
Flugplatz Donaueschingen-Villingen GmbH	Stadt Bayreuth
Flugplatz Eggenfelden GmbH	TRIWO Airport Services GmbH
Flugplatz Giebelstadt GmbH	Verkehrslandeplatz Haßfurt-Schweinfurt GmbH
Flugplatz Mengen-Hohentengen GmbH	Viessmann Werke GmbH & Co. KG

Source: BAF

Risk Management

Providers in the field of ATM/ANS can and must change and adapt their functional systems. Most of these changes have an impact on the safety of air traffic and are therefore relevant to safety.

The Risk Management Division at the BAF processes applications from air navigation service providers for the modification of functional air traffic services systems. For this purpose, the Risk Management processes and assesses the modification requests of the air navigation service providers as well as the safety assessments (ATS) and supporting safety assessments (non-ATS) submitted on request in connection with the planned modification projects. Such modifications can be, for example, new systems or new procedures, or new qualification requirements for the personnel. The planned modification

will then be approved. Here, too, the focus is on identifying and assessing risks as well as eliminating or reducing them so that no unacceptable safety risks arise for aviation. Furthermore, if providers of support services (non-ATS) make modifications, it must be demonstrated that the service continues to meet the requirements (specifications) imposed on it after a modification.

In 2019, a total of 96 change requests and in 2020 a total of 157 change requests by nine different air navigation service providers were recorded. In addition, there were 90 so-called "non-safety-related modifications" in 2019 on the basis of the old Regulation, which was valid until 1 January 2020. For the above-mentioned notified modifications, the underlying arguments were randomly requested and assessed. The corresponding breakdown for the years 2019 and 2020 is shown in Table 2.

Table 2: Notified modifications to functional air traffic services systems (NoC) in 2019/2020 and breakdown according to their provider

Provider	2019	2020
Adolf Würth Airport Schwäbisch Hall	2	0
Austro Control GmbH	3	15
DAS	6	18
DFS Deutsche Flugsicherung GmbH	66	93
DWD	15	20
ESPA	1	5
EUROCONTROL	1	4
FABEC	2	2
RNA Rhein Neckar Air GmbH	0	0
Sum	96	157

Source: BAF

State Safety Programme

The Federal Ministry of Transport and Digital Infrastructure (BMVI) defines the framework conditions for safe and sustainable civil aviation in Germany on the basis of applicable national and international regulations. This includes the publication of a safety programme, the "State Safety Programme", to which Germany is obliged as a member of the International Civil Aviation Organisation (ICAO).

The national description of the safety management system can be found in the State Safety Programme of the Federal Republic of Germany. It is based on Annex 19 to the Convention on International Civil Aviation. It contains, among other things, the four sectors that the national State Safety Programme must take into account.



Cover page of Germany's State Safety Programme
Source: BMVI

These sectors are:

- Aviation safety strategy, goals and resources
- Risk management
- Ensuring safety
- Promoting safety, communication

If safety risks are identified within the framework of the respective task execution, they are recorded in the above-mentioned "State Safety Programme", as required by ICAO. In addition, in the interest of nationwide safety action, they are linked with the data of the other aviation authorities to form a national safety and risk situation, in order to be able to initiate necessary and appropriate measures for eliminating risks or at least reducing them.

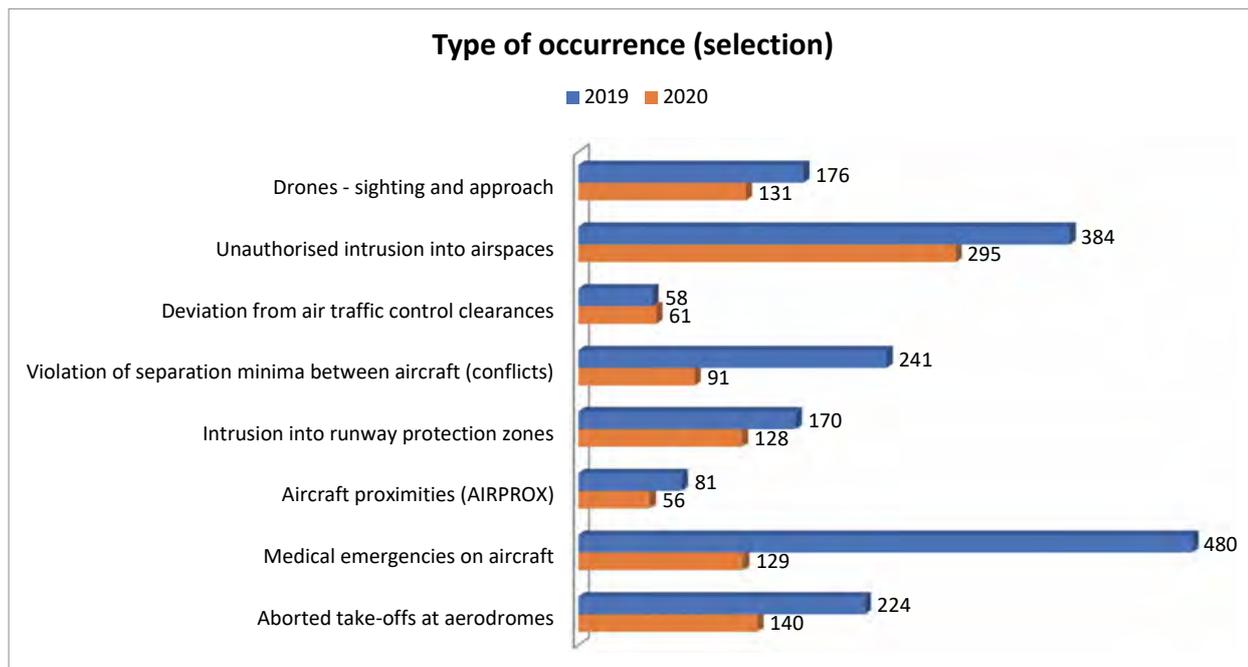
After a total of two years of work and with the active participation of the BAF, the first German State Safety Programme (SSP) in accordance with ICAO requirements

was presented at the end of 2019. It was put into force in April 2020 by the Federal Minister of Transport and Digital Infrastructure with the participation of all federal departmental authorities as well as the supreme aviation authorities of the federal states.

Reporting System for Safety-Relevant Occurrences

Air navigation service providers are obliged to report safety-relevant occurrences to the BAF. A total of around 10,500 occurrences were reported to the BAF within the framework of the national reporting system in the two reporting years and the risk of these occurrences was assessed. These were then transferred to the national database together with the occurrences recorded at the Federal Aviation Office (LBA). The data was jointly evaluated and then anonymised and forwarded to EASA for storage in the European central repository of all occurrences.

Diagram 1: Development of the annual reporting of occurrences in 2019/2020



Source: BAF

Aircraft Proximities

A particular feature of the occurrence reports are the so-called aircraft proximities (AIRPROX). In Germany, the APEG (Aircraft Proximity Evaluation Group) was founded by the Federal Ministry of Transport and Digital Infrastructure (BMVI) to record and evaluate these data. The APEG meets regularly under the direction of the BAF and discusses and evaluates the recorded APEG cases together with aviation experts (airlines, associations, air navigation service providers). In order to raise awareness in general aviation, APEG members have taken the initiative to publish exemplary aircraft proximities in the form of a magazine. For example, the BAF was able to publish the so-called AIRPROX magazine for the first time at the AERO air show in April 2019. In it, the APEG anonymously presented incidents, identified causes and contributing factors for the cases investigated and used them to develop recommendations for avoiding future situations. An AIRPROX magazine with new cases was also published in 2020.



Cover page of the publication "AIRPROX Magazine 2020"
Source: BAF in the context of the APEG

The work of the APEG in particular shows what the principle of "just culture" can achieve. Through a voluntary and anonymous reporting possibility for aviation, the entire system can learn from this in order to create appropriate recommendations to increase safety. The benefit is there for all, because only a learning system can continuously improve with safety recommendations.

Air Traffic Services Personnel

The basis of the BAF's supervisory activities in the area of air traffic services personnel is Commission Regulation (EU) 2015/340. It specifies the requirements for safety oversight with regard to personnel, their qualifications and language skills as well as medical fitness. Also included are the requirements for the training organisations, language testing centres and aeromedical centres to be certified. In parallel, national law is also applicable, namely the Air Navigation Services Personnel Training Ordinance (Flugsicherungspersonalausbildungsverordnung/ FSPersAV), which is currently being revised.

Licensing and Competence Maintenance

In total, this section is responsible for the initial licensing and ongoing maintenance of licences for almost 3,000 air traffic controllers. Likewise, nearly 200 aerodrome flight information service officers (AFISO) and more than 600 air traffic safety electronics personnel (ATSEP) were licensed. In this way, it was possible to ensure for all air traffic services personnel that both the required acquisition of competences and the maintenance of competences of the personnel of the air navigation service providers take place.

Aviation Medicine

Another area of responsibility is the supervision of the approx. 90 aeromedical examiners (AME) working for the BAF as well as the seven medical class 3 (MC3) aeromedical centres.

To this end, BAF teams consisting of aeromedical assessors and supervisory experts inspected approximately 30 medical practices per year.

In 2020, due to Corona, there was a partial switch to expert examinations and video conferences in which the aeromedical practices and centres had to provide their evidence.

Air Navigation Services Technology

The BAF exercises safety oversight of the air navigation services technology provided as a service by air navigation service providers in Germany. This includes supervision of the technical safety of air navigation services facilities for communication, navigation and surveillance (CNS).

Interoperability

In the field of interoperability, the standard tasks consist of

- Accepting and verifying EC declarations of conformity from air navigation service providers declaring compliance with basic and technical requirements and
- Auditing air navigation service providers for compliance with interoperability requirements.

The interoperability directive was revised and reissued in an updated form for air navigation service providers and manufacturers in 2020.

In the reporting period, the major challenge for the area of interoperability was the change in the regulatory situation. The previous legal basis, Regulation (EC) No 552/2004, was repealed by Implementing Regulation (EU) 2018/1139. At the same time, however, the most important articles of Regulation (EC) No 552/2004 remain in force until September 2023. The questions that arose in the application of the relevant articles of both regulations were raised and clarified at European level. With the publication of an explanatory document by the EASA, a uniform

understanding is now once again ensured. This explanatory document was incorporated into the BAF directive on interoperability and published as version 5.1. The biggest change in the regulatory situation is the EC verification of meteorological systems that has now become necessary - as far as they are relevant for air traffic services

In September 2023, the articles of Regulation (EC) No 552/2004 that are currently still applicable will cease to be valid. The EASA therefore launched a working group in February 2020. The Interoperability Division is involved in this and supports with expertise from the areas of interoperability and type certification. The aim of the working group is to create a new legal basis for ensuring interoperability. The first milestone is the preparation of the so-called "Noticed Proposed Amendment" (NPA), which



BAF directive "Interoperability for air navigation service providers and manufacturers" (Version 5.1 of 22 June 2020)
Source: BAF

contains the background for the regulation as well as a proposed regulation. The completion of the NPA is planned for the first quarter of 2021.

Type Certification

GBAS certification procedures

In Bremen and Frankfurt, the DFS Deutsche Flugsicherung GmbH operates the GBAS SLS-4000 CAT I ground stations of Honeywell. The GBAS system enables approaches with satellite navigation, i.e. independent of conventional ground-based instrument landing systems, by transmitting an additional signal, which compensates for any inaccuracies in the satellite signal (GPS or Galileo).

The GBAS SLS-4000 was first approved in 2011 with the Block 0 version; the Block 1 version was approved in 2014. During the reporting period, the approval process for the Block II version was under way. The GBAS SLS-4000 Block II update includes changes in the area of software (e.g. to

improve service availability, the signal quality monitor and options of the measured site data process). Type certificates for these changes were issued in May 2019.

Within the scope of the certification for Block II, the certification of an optional use of SBAS reception was also applied for. The use of SBAS reception is optional and creates the conditions for CAT II operations with CAT I ground station equipment. Since operation of the option is currently only certified for the American SBAS system WAAS, further analyses for operation with the European SBAS system EGNOS must be carried out for type certification. The manufacturer is currently working on the final verification for the use of the SBAS receiver option with EGNOS.

Due to changes in the technical standards (ICAO, RTCA), the possibility arose during the certification procedure to introduce an Expanded Service Volume (FSV) for the use of the GBAS facility. This is an extension of the GBAS service "volumes" for precision approaches, which was previously set at 23 NM. The manufacturer has applied for certification



GBAS facility at Frankfurt Airport (on the left the antenna for radiating the GBAS correction signal and on the right the technology container that houses the technology)

Source: BAF



One of the antennas with an external unit for receiving the GPS satellite signals from which the GBAS correction signal is calculated

Source: BAF

that would allow the ESV to be extended up to 35 NM in Germany. The necessary evidence that the position errors of the GBAS system are within the permissible limits was submitted to the BAF. The certification procedure for the SBAS receivers and the ESV could not yet be completed in the reporting period.

Requirements for the Type Certification of Air Traffic Services Equipment and Facilities

The legal basis for the implementation of the type certification procedures is the Ordinance on the Type, Scope, Characteristics, Certification, Marking and Operation of Facilities and Equipment for Air Navigation Services (Flugsicherungsmusterzulassungsverordnung/FSMusterzulV).

To explain the type certification procedure, the BAF published a leaflet on type certification for manufacturers of air navigation facilities and systems in the spring of 2020. It serves as support in the procedure for manufacturers who are subject to the FSMusterzulV. The leaflet describes the role of the manufacturers, the procedure and scope of the type certification as well as the interfaces between the manufacturer and the BAF. The leaflet is available on the BAF website.

In addition to conducting the type certification procedures, the BAF is responsible for regularly updating the type certification requirements and publishing them in the Nachrichten für Luftfahrer (NfL).

The following requirements for the type certification of equipment and facilities for air navigation services were revised. A publication in the Nachrichten für Luftfahrer and on the BAF website took place in 2019/2020:

- Notice on the type certification requirements for VHF radio direction finders in the 117.975 - 137 MHz frequency range (NfL 2-507-20)
- Notice on the type certification requirements for radar facilities as fixed radiodetermination stations (NfL 2-520-20)

- Notice on the type certification requirements for radio distance measuring facilities as aeronautical radionavigation stations (NfL 2-521-20)
- Notice on the type certification requirements for instrument landing systems as aeronautical radionavigation stations (NfL 2-522-20)
- Notice on the type certification requirements for microwave landing systems as aeronautical radionavigation stations (NfL 2-523-20)
- Notice on the type certification requirements for non-directional radio beacons as aeronautical radionavigation stations (NfL 2-524-20)
- Notice on the type certification requirements for omnidirectional radio beacons as aeronautical radionavigation stations (NfL 2-525-20)

Currently under revision is an

- NfL with the type certification requirements for ADS-B ground stations. Publication is scheduled for the beginning of 2021.
- NfL with the type certification requirements for GBAS ground stations as aeronautical radionavigation stations. This is intended to include the requirements for GBAS ground stations capable of CAT III. It is planned to coordinate the certification requirements with the European supervisory authorities with the aim that a type certificate issued on the basis of this requirement can be recognized at European level.

Flight Inspection

The Flight Inspection Division supervises service providers in the field of flight inspection. Among other things, it controls the quality of the equipment as well as the type and execution of flight inspections. One focus in flight inspection was the clarification of the operating conditions of direction finders in Germany and their use in conformity with EU regulations.

At the beginning of 2019, the Flight Inspection Division prepared a tender – including the specification - for the project "GBAS-VDB Field Strength" to determine the field strength in the vicinity of GBAS-VDB transmitters (VDB-Very High Frequency (VHF) Data Broadcast). Due to the technical advancement of the GBAS systems offered on the market, which - with distributed transmitting stations - no longer have to be set up within the actual area of use, these activities were discontinued.

Participation in Flight Inspection Topics at European Level

With the entry into force of Implementing Regulation (EU) 2017/373 on 2 January 2020, there has also been a change in the regulatory situation for flight inspections. Specifically, the Commission now also regulates partial aspects of flight inspections with the flight procedure preparation process. During the reporting period, contributions were made to supplement the regulations in working groups of the Commission and EASA. The aim of the working group was to develop acceptable and alternative ways as well as guidelines for meeting the requirements. Since only partial aspects of flight inspection were taken into account in Implementing Regulation (EU) 2017/373, the



A calibration aircraft of the FCS company is waiting to be used for a flight inspection

Source: Ernst Legal

Flight Inspection Division considers it necessary to also regulate the remaining parts of flight inspection, which are still regulated nationally, at European level. It has therefore initiated corresponding measures in this direction.

The Commission's Implementing Regulation (EU) 2018/1048 laying down requirements for the use of airspace and operational procedures in relation to performance-based navigation requires the member states to have a coordinated changeover plan. Here, too, the BAF participated with the Flight Inspection Division in the responsible coordination committee of the European Commission during the reporting period.

Protection of Facilities

WERAN (plus) Project

In the WERAN plus project funded by the Federal Ministry for Economic Affairs and Energy (BMWi), the Federal Standards Laboratory (Physikalisch-Technische Bundesanstalt/PTB) investigated the effects of wind turbines on Doppler VHF omnidirectional ranges (DVOR). For this purpose, drone-based on-site measurements at DVORs and numerical full-wave simulations were carried out. On this basis, the formula developed by the DFS for the calculation of disturbances was further developed and adapted in cooperation with the PTB.

The results were published in advance for scientific comment and also presented to a specialist audience at the "Specialist Meeting on Electromagnetic Waves and Wind Turbines" in Toulouse in December 2019. In addition, there was the possibility to participate in a so-called ring comparison. Institutions that also deal with this topic were asked to replicate the research results of WERAN plus. The results were then compared with each other.

The BAF has accompanied this process and now makes decisions based on expert opinions from the DFS using the new calculation formula as a basis. As a result, the Facility Protection Division handed over unfinished processes to



Wind turbines are approached with a drone to check the interaction with terrestrial navigation/radar
 Source: Federal Standards Laboratory (Physikalisch-Technische Bundesanstalt/PTB)

the DFS for reassessment. These processes showed that with the new calculation formula, the BAF was able to approve further wind turbines that were still rejected according to the old calculation method. The Federal Standards Laboratory (PTB) is currently continuing its investigations on conventional VHF omnidirectional radio ranges (CVOR) in order to develop an improved calculation formula for these air traffic control facilities as well. However, results cannot be expected until the beginning of 2021.

At the same time, the Federal Standards Laboratory (PTB) is also investigating the determination of the so-called "pre-exposure" of an air traffic control facility. This can result from the surroundings (terrain, existing buildings, etc.) of omnidirectional radio ranges. Initial approaches have already been presented, but further investigations by the PTB will follow. Once the scientific results are available and validated, they have to be transferred into a practical application. It is in particular due to the necessary validations that it is currently not foreseeable when a change will take place here in order to make a contribution to the energy transition from this side as well.

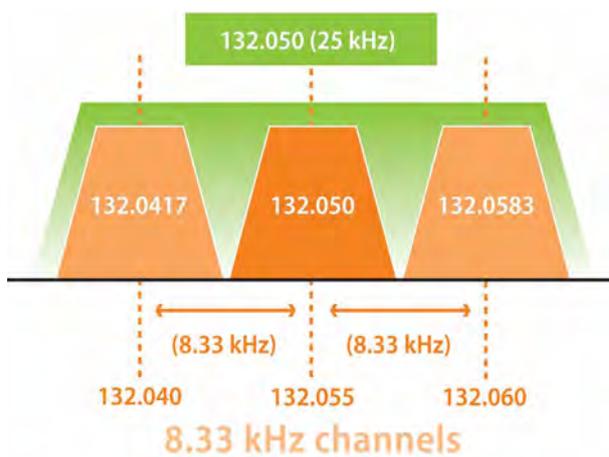


Homepage of the web tool 3D Preliminary Check of Facility Protection in the BAF
 Source: BAF

3D Preliminary Check App

For many years now, the general public has been able to use an interactive map on the BAF homepage to determine whether a planned structure is located in a facility protection area of an air traffic control facility. However, this map only provides two-dimensional information. Since it is particularly the height that plays a decisive role in assessing the impact of a structure, the BAF commissioned the development of a web tool in 2020.

This tool performs a three-dimensional check and can be accessed and used by citizens, planning agencies, public authorities, etc. via the BAF homepage. The result is a report that provides information on whether a structure is located within a facility protection area. If this is not the case, there is no need for a further examination in accordance with § 18a LuftVG (Aviation Act). If a structure is located within a protection zone, the structure's data are already available electronically as a process and can be further processed by the responsible aviation authority and the BAF as part of the approval procedure. This web tool is expected to be available in March 2021 and represents a contribution by the BAF to the digitalization of the administration.



Graphical representation of the 8.33 kHz Voice Channel Spacing
 Source: Eurocontrol "8.33 kHz Voice Channel Spacing (VCS) Implementation Handbook"



Acher radio station of the DFS Deutsche Flugsicherung GmbH
 Source: DFS Deutsche Flugsicherung GmbH

Frequency Management

Result of the Changeover to the 8.33 kHz Channel Spacing

With Implementing Regulation (EU) 1079/2012, the use of radio equipment with a channel spacing of 8.33 kHz has become mandatory for aircraft and air navigation services. Although implementing the requirements of this Regulation appeared to be simple from a technical point of view, it became apparent in practice that the effort required of those involved was very great.

Due to the increasing demand for radiotelephony channels in aeronautical communications, the European Commission extended the introduction of the 8.33 kHz channel spacing for radiotelephony equipment to lower airspace, i.e. below flight level 195 (19,500 feet or approx. 5,944 m), back in 2012. The requirements regarding this voice channel spacing for the Single European Sky were announced in the European Commission's Implementing Regulation (EU) No 1079/2012. The details of the measure were made binding on the Member States therein.

Originally, the Implementing Regulation required a completion of the conversion by 31 December 2018. For a variety of reasons, however, this schedule was delayed until the end of 2020, so that this conversion was completed almost two years later than planned. Furthermore, the channels for which no changeover is planned according to the Implementing Regulation remain unchanged. These include, for example, the frequencies which are operated in offset mode or the general emergency frequency.

For the DFS in particular, with its large number of aeronautical ground radio stations, the changeover was an enormous effort. This was due to the fact that not only the radios themselves had to be renewed, but also some of the infrastructure and peripherals for the radios. Moreover, the conversion was complicated by the fact that some of the radio stations were located in remote and less accessible areas.

Compared to other European countries, however, Germany is in a very good position, as the conversion at its European neighbours has also been considerably delayed and it must be taken into account that Germany is one of the larger countries in the EU.



A drone and an aircraft in flight
Source: DFS Deutsche Flugsicherung GmbH, Hans-Jürgen Koch

Spectrum Protection and Drones

An increasingly relevant topic in the field of frequency management is the non-private use of drones. These are now used for a wide variety of purposes.

If drones are used in controlled airspace and especially in the control zones of airports, it is important for the responsible controllers that they are visible in the air situation pictures. To date, the existing technology of Mode-S transponders has been used for this purpose. However, due to the increasing load on the frequencies 1,030 and 1,090 MHz required for this purpose, there is the danger that these frequencies will be overloaded and aircraft will thus no longer be displayed in the air situation pictures. New technical solutions are needed here, based on mobile radio technology, for example.

But even when disregarding the use of drones, the protection of both frequencies and also the transponders of the aircraft that process them is a key issue across Europe in the existing surveillance infrastructure environment. The European Organisation for the Safety of Air Navigation, EUROCONTROL, is therefore planning to set up a Europe-wide network to record and analyse the load. The EASA is

also working on a "high-level regulatory framework for the U-space" at European level (cf. the chapter "U-space and drones").

With its Frequency Management Division, the BAF accompanies current developments with a focus on spectrum protection to ensure the safety of aircraft with so-called detection.

Audit Management

The BAF's performance of its tasks in 2019 and 2020 was greatly influenced by the changes to the fundamental EU regulations in the air transport sector. These changes were not only related to the audit requirements vis-à-vis air navigation service providers and their personnel, but even more importantly to the tasks and responsibilities of the supervisory authorities themselves.

The EU Commission laid down significant new requirements in Implementing Regulation (EU) 2017/373, which has been valid since 2 January 2020. In this Implementing Regulation, the requirements pertaining to audit management were regulated in a more specific and detailed manner. Among other things, the requirements for the audit planning cycle were significantly changed.

In 2019, ongoing auditing was still carried out in accordance with the old regulation in force then. At the same time, however, the BAF worked on the conversion to the new requirements of Implementing Regulation (EU) 2017/373 applicable from 2020. In addition, Implementing Regulation (EU) 2017/373 contains provisions on the management system of the supervisory authorities (see chapter "Authorities Manual and Integrated Management System (IMS)").

Audits of Air Navigation Service Providers

Common to all audit management tasks is that they continuously collect and assess safety risks associated with

and related to the provision of air navigation services and compile them into a safety management and risk score per air navigation service provider. This results in the degree of auditing intensity per air navigation service provider or training organisation.

The annual auditing programmes for the two years included a total of 105 and 90 audits and inspections, respectively. In 2019, a total of 99 audits were carried out, partly as desktop audits but mainly as on-site audits and inspections. In 2020, a total of 65 audits were eventually carried out. Because of the Corona pandemic, the auditing programme was revised and all audits scheduled for April 2020 were suspended. Due to the development of events in connection with the coronavirus, the auditing programme was eventually postponed to be made up for in the course of the year as so-called remote audits, i.e. by means of video conferencing.

In 2019, 55 audits of air navigation service providers and 13 audits of training organisations were carried out in this way. In 2020, 26 audits were carried out at air navigation service providers and 8 at training organisations. In both years, 31 inspections of flight surgeons and aeromedical centres took place. A total of 69 complaints were raised in 2019 and a further 48 in 2020.

In addition to the planned and conducted audits and inspections, the core areas of safety oversight include the fields of occurrence management (recording and assessing special occurrences) and risk management (recording and assessing as well as approving changes to the functional system) (cf. chapter "Air Navigation Service Providers").

Table 3: Breakdown of the audits carried out in 2019/2020 according to the type of service

Audit area	2019	2020
General requirements	11	12
AFIS	7	0
AIS	2	1
ATFM/ASM	0	1
ATS	15	5
CNS	15	4
Medical	31	31
MET	5	3
Training organisations	13	8
Sum	99	65

Source: BAF

Audit at the Remote Tower of the DFS

In 2018, the DFS put its remote tower service (RTC) for Saarbrücken Airport into operation at the Leipzig site. The BAF had accompanied the introduction planning and implementation with various specialist departments and ultimately approved it on the basis of a submitted safety assessment. In 2019, the BAF therefore conducted a simultaneous audit for the first time at the RTC site in Leipzig and concurrently at Saarbrücken Airport with the respective technical systems and at the new controller operating positions.

Audits in the Field of Air Navigation Services Technology

The Flight Inspection Division supervises service providers in flight inspection. It checks the quality of the equipment,

the type and execution of flight inspections and the reproducible documentation of the measurements. It also supports the Federal Ministry of Transport and Digital Infrastructure (BMVI) with its technical expertise in the preparation of regulations in the field of flight inspection.

In the area of flight inspection, two audits were carried out in May and June 2019 in connection with the flight inspection of instrument landing systems at Leipzig and Augsburg. Furthermore, an audit was carried out at a CNS service provider in Langen in November 2020.

Flight inspection audits serve to verify whether the requirements of the relevant regulations relating to flight inspection are monitored, implemented and complied with by the commissioning companies and whether the companies' processes enable flight inspection in compliance with the regulations.



The picture shows remote tower control of the DFS at Saarbrücken
Source: DFS Deutsche Flugsicherung GmbH

Economic Oversight

Economic oversight describes the supervision of the commercial and operational processes of air navigation service providers. Within the framework of the Single European Sky (SES) legislation, this comprises a differentiated system with objectives in the key performance areas of safety, capacity, environment and cost efficiency.

Performance Monitoring: Reference Period 2 (2015-2019)

Within the framework of the performance planning system, corresponding performance plans are drawn up and compliance with them is monitored by the national supervisory authorities. Since the first reference period (RP1 from 2012-2014), Germany has been acting together with Belgium, the Netherlands, Luxembourg, France and Switzerland within the framework of the Functional Airspace Block Europe Central (FABEC). This cooperation ensures transnational cooperation and coordination and thus the achievement of synergy effects. The specific air traffic control charges to be set annually are derived from these performance plans, adjusted in each case by certain modifications.

The year 2019, as the last year of reference period 2, was characterised by a significant increase in service units, as were the other years. Both compared to the previous year (+1.3% in the en-route segment and +1.2% in the terminal segment) and especially compared to the original planning (+13.2% and +7.2% respectively), the number of flights adjusted by a weight factor increased steadily.

Safety Performance Area

Despite the increase in traffic, both Germany in the context of oversight and the DFS Deutsche Flugsicherung GmbH were able to meet the set target values in the performance area of safety. The high level of effectiveness of the safety management system aimed for was achieved

and the aspired target value for so-called safety-relevant occurrences was significantly undercut.

Environment Performance Area

In the environment performance area, the target value for the key performance indicator "horizontal flight path efficiency" was not achieved in 2019 with an actual value of 3.32% (target value: 2.96%). It also deteriorated slightly compared to the previous year (3.25%). The performance indicator "horizontal flight path efficiency" indicates the deviation of the actual flight path from the shortest possible one (so-called great circle) and is measured at FABEC level.

However, the deviation can never be zero, since, for example - especially in 2019 - traffic density, but also other factors such as military exercise projects, approach and departure procedures and weather situations (e.g. thunderstorms) made detours unavoidable.

Capacity Performance Area

To improve capacity and prevent another delay problem in the summer of 2019, the European Commission launched an air traffic management initiative. Due to a large number of measures, the key performance indicator of average delay per flight for enroute flights in the FABEC region was improved compared to the previous year (2018: 2.14 min./flight; 2019:1.68 min./flight). However, the target value of 0.43 min./flight could not be achieved.

Since the target value for the share of delays attributable to air traffic control at FABEC level was not achieved either (target 2019: 0.34 min./flight; value 2019:1.22 min./flight), malus payments were determined for those air traffic control service providers who contributed to this underperformance.

The second key performance indicator of capacity, namely air traffic flow management (ATFM) arrival delay per flight in minutes, is calculated and monitored at the state level.

At the 16 airports within the regulatory system (so-called § 27d LuftVG airports), very good values were recorded in 2019 with an actual delay of 0.39 min/flight against a target value of 0.69 min/flight.

Performance Planning: Reference Period 3 (2020-2024)

With regard to economic oversight, the regulatory situation changed during the reporting period in that in the area of performance planning and charging, Implementing Regulations (EU) 390 and 391/2013 were replaced by Implementing Regulation (EU) 2019/317 for the third reference period (2020-2024).

With the adoption of Implementing Regulation (EU) 2019/317 on 11 February 2019, the actual performance planning process for reference period 3 was formally launched.

Based on the performance targets set by the European Commission's Implementing Decision (EU) 2019/903 and the corresponding traffic forecast by EUROCONTROL, the BAF requested the air navigation service providers DFS and MUAC as well as the German Meteorological Service in the summer of 2019 to submit specific plans for achieving these targets.

After evaluating the corresponding planning data, it has become apparent that the EU-wide target values cannot be achieved, especially in the key performance areas of environment, capacity and cost efficiency. In the opinion of the BAF, the definition of these targets and the adaptation of these targets to the local level by the network manager did not take into account significant local characteristics. This made it necessary that target values were set by the BAF and within the framework of the FABEC which formally deviate from the European ones.

In the area of capacity, for example, the target values cannot be achieved even under the most favourable conditions because the necessary additional staff will not

be available until around 2023 due to the long time needed for training. Moreover, relevant technical innovations (which have not yet been started) can only be implemented with a lead time. This is also reflected in the targets set by the FABEC itself, which are significantly lower than the previous years' values from 2023 onwards. The reference values in the environment area were also not feasible at the time of planning due to the high traffic load, among other reasons. In the area of cost efficiency, the cost reductions envisaged by the European Commission could not be realized due to, among other things, the increase in traffic and the associated additional personnel costs, but also due to rising pension costs.

In accordance with the statutory deadlines, a first draft performance plan was submitted by the FABEC to the European Commission by 1 October 2019. Due to the disruption of travel relations caused by the SARS-CoV-2 pandemic and the global economic crisis as well as the associated necessary reassessment of traffic development, the European Commission did not adopt the official assessment. Instead, the performance planning process was stopped in the spring of 2020 and restarted on the basis of Implementing Regulation (EU) 2020/1627 to the effect that a new draft performance plan must be submitted by 1 October 2021.

Determination of Air Traffic Control Charges

Air traffic control charges are on principle determined on the basis of the performance plans approved by the European Commission and after consultation with airspace users. For 2020, the draft performance plan from the autumn of 2019, which had not yet been adopted, was used as a basis.

The costs per service unit determined according to these plans are adjusted annually on the basis of certain parameters for the following year. If the traffic volume is higher than anticipated and additional revenues are thus generated, this money is refunded to the airspace users two

years later on a pro rata basis in the form of lower charges; the same procedure is applied to subsidies received for investment projects.



Eurocents on a surface with an EU flag
Source: European Parliament Photogallery

Table 4: En-route and terminal air traffic control charges in 2019

En-Route

	Charges according to the performance plan	Actual charges after adjustments
2019	69,01 EUR	63,63 EUR
2020	71,64 EUR	63,61 EUR

Terminal

	Charges according to the performance plan	Actual charges after adjustments
2019	129,11 EUR	124,34 EUR
2020	135,05 EUR	126,29 EUR

Airspace, Flight Procedures and Law

The Airspace, Flight Procedures and Law Branch (LFR) is responsible for establishing flight procedures and issuing transit flight permits for restricted areas (ED-R). Its tasks also include the prosecution of administrative offences in air traffic.

Establishment of Flight Procedures

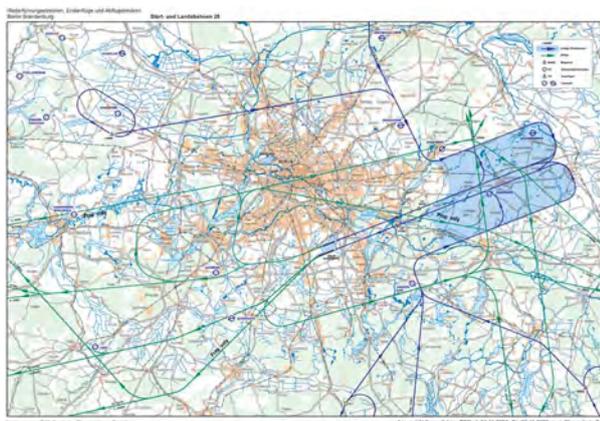
In the reporting period, in addition to day-to-day business, two major flight procedures were established that already had a longer history and received a great deal of public attention. Both were completed in 2020.

Completion of Flight Procedures for Berlin-Brandenburg Airport (BER)

The opening of Berlin-Brandenburg Airport (BER) on 31 October 2020 and the commissioning of the new southern runway and thus the expanded parallel runway system on 4 November 2020 required new flight procedures. These procedures had already been established well in advance in June 2020.

Flight procedures for BER had already been established for the first time in January 2012 in the form of the 247th Implementing Regulation (DVO) to the Aviation Regulation (LuftVO). The opening of BER, which was planned at the time, was postponed to an indefinite period shortly before the opening date.

For the opening of Berlin-Brandenburg Airport (BER), which finally took place in October 2020, the flight procedures of the 247th Implementing Regulation (DVO) had to be updated and slightly adjusted. For this purpose, a revised version of the 247th DVO was put into force on 4 November 2020, without, however, changing the fundamental course of the flight procedures. The adjustments were mainly due to the fact that it had been decided in the meantime to continue using the existing terminal of Berlin Schönefeld Airport. In deviation from the original concept, it was thus necessary that approaches to and departures from both runways are possible from and to all directions.



Flight procedures and radar vectoring routes at the new Berlin Brandenburg Airport for flight operations in a westerly direction
Source: DFS Deutsche Flugsicherung GmbH

In the context of the amendment to the 247th Implementing Regulation (DVO), it was in particular the straight-ahead departure in a westerly direction from the north runway at night that was re-established. This is a flight path that had long been the subject of controversy in both the Aircraft Noise Commission and the general public, and had also been the subject of legal disputes. Due to the lawsuit filed by the municipality of Blankenfelde-Mahlow, the Higher Administrative Court of Berlin-Brandenburg had determined in 2013 that the night-time departure procedures established in 2012 were unlawful, so that the BAF had to reconsider this flight route and make a new decision.

In the context of the renewed consideration, the BAF again came to the conclusion in June 2020 that the straight-ahead departure is to be regarded as preferable - in particular for noise protection reasons - compared to an alternative known in the public discussion as the "Blankenfelde-Mahlow northern bypass".

Frankfurt Airport and the "Lateral Optimization AMTIX Short"

The change in flight procedures at Frankfurt Airport, which became known to the interested public under the title "Lateral optimization AMTIX short", was similarly controversial.

This is a proposal that was developed by the Aircraft Noise Commission in cooperation with the Forum Airport and Region (Forum Flughafen und Region/FFR) as part of the "Programme of Measures for Active Noise Protection". The aim was to fly around the settlement centres by exploiting new technical possibilities. With the implementation of the measure "Lateral optimization AMTIX short", the north of Darmstadt in particular was to be relieved of aircraft noise.

After an extensive examination of different variants and the implementation of a comprehensive local consultation procedure - a unique form of public participation that goes far beyond the legal requirements - the Aircraft Noise Commission decided in favour of the preferred variant submitted by the DFS Deutsche Flugsicherung GmbH. In August 2020, this variant was finally established by the BAF, which required a change to the departure procedures from Runway West at Frankfurt Airport within the framework of the 59th Amendment Ordinance to the 212th Implementing Regulation (DVO) to the Aviation Regulation (LuftVO). However, the changes to the flight procedures referred to as "AMTIX short" only make up a portion of the extensive ordinance text, which includes further changes to flight procedures at Frankfurt Airport. It is intended to evaluate the use of the modified departure procedures after conducting trial operations first.

Legal Proceedings

Establishment of Flight Procedures

As in previous years, court cases relating to the establishment of flight procedures continued to decline in 2019 and 2020. A few weeks before the opening of the airport, the Higher Administrative Court of Berlin-Brandenburg ruled on the last pending lawsuit against the flight procedures established for BER. It dismissed the complaint without allowing an appeal. After expiry of the appeal period, the ruling has since become legally binding. The lawsuit concerned the departure procedures from BER known as the "Wannsee route".

What was particularly disputed was the question of whether their establishment had relevantly increased the risk of an aircraft crashing on the research reactor of the Helmholtz-Zentrum-Berlin located in Berlin-Wannsee, which, incidentally, was decommissioned in December 2019. The court had already dismissed two parallel actions in September 2017. According to the court, the new action lacked admissibility.

As a result, the lawsuit against the departure procedures from Frankfurt Airport referred to as the "southern bypass" is now the last court case to be decided at present concerning the establishment of a flight procedure. It was dismissed by the Hessian Higher Administrative Court (VGH) in its ruling of 14 February 2019, with leave to appeal. The Federal Administrative Court will now decide on the appeal filed by the remaining plaintiffs. After it had already overturned the first-instance ruling - which had initially been favourable - in December 2015 and referred it back to the Hessian Higher Administrative Court (VGH) for a new hearing, it is now dealing with the southern bypass for the second time.

Air Navigation Technology - Protection of Air Navigation Facilities

There were hardly any decisions in legal proceedings relating to the protection of air navigation facilities in 2019 and 2020. Many proceedings had become outdated with the publication of the results of the "WERAN (plus)" project conducted by the Federal Standards Laboratory (Physikalisch-Technische Bundesanstalt/PTB) and funded by the Federal Ministry for Economic Affairs and Energy (BMWi).

WERAN (plus) developed a new calculation methodology for the prediction of disturbances of Doppler VHF omnidirectional ranges (DVOR) by wind turbines. In this context, the BAF reviewed all its decisions on DVORs pursuant to § 18a LuftVG whose approval procedures had not yet been legally concluded. As a result, some construction bans could be revised and negative decisions withdrawn (cf. chapter "Protection of Facilities").

An unusual - due to the underlying constellation - but nevertheless important decision was made by the Administrative Court of Hannover in accelerated proceedings (Administrative Court of Hannover, decision of 10 September 2019). For the first time, the central question was under which conditions air navigation facilities that have not yet been built may be taken into account by the BAF within the scope of decisions pursuant to § 18a LuftVG.

The Administrative Court clearly stated that such decisions can be based on anticipated future developments. It did not object to the fact that the BAF took an air navigation facility that was only in the planning stage and had not yet been constructed as the basis for its decision. Experience has shown that planning in the interest of aviation can only be realized over a longer period of time. Therefore, the BAF has to examine each construction request on a case-by-case basis to see whether it could become an obstacle to the realization of these plans.

Numbers, Data, Facts

Citizens' Inquiries According to the UIG/IFG

The BAF records citizens' inquiries under the Environmental Information Act (UIG) and the Freedom of Information Act (IFG). The following table shows the types of inquiries and complaints that have reached the BAF. As of the reporting period 2019/2020, which is covered by this annual report, the recording of petitions and complaints has changed. To avoid statistical distortions, the counting of so-called multiple complaints with identical content was discontinued.

Whenever major or intrusive changes to flight procedures are implemented, the number of inquiries and complaints increases. This can be clearly seen with regard to Frankfurt Airport but also Berlin Airport, where the corresponding figures have also been slowly rising again.

Table 5: Citizens' inquiries and complaints in 2019/2020 (UIG/IFG)

Petitions and complaints in 2019 (including requests according to the IFG and UIG)	
Location or subject allocation	Number
Berlin	3
Frankfurt	12
Other (major) airports with international connections	24
Other aerodromes and further inquiries and petitions that concern air traffic and airspace	26
Total	65

Petitions and complaints in 2020 (including requests according to the IFG and UIG)	
Location or subject allocation	Number
Berlin	21
Frankfurt	17
Other (major) airports with international connections	32
Other aerodromes and further inquiries and petitions that concern air traffic and airspace	80
Total	150

Source: BAF

Permits to Fly through Restricted Areas (ED-R)

Since 2010, the overall number of transit flight permits applied for and approved by the BAF has been steadily increasing. The processes are largely characterised by applications for the commercial use of unmanned aircraft systems (drones/UAS).

Particularly significant in this context are the metropolitan areas of Berlin and Potsdam. Furthermore, applications are often made for restricted areas used for military purposes as these areas often cover extensive stretches of land and thus include settlements (towns, industrial estates, etc.) and terrains that are used commercially. To manage the land underneath, manned aircraft and drones fly through these restricted areas.

The SARS-CoV-2 pandemic, which largely shaped economic and public life in 2020, led to a measurable but ultimately only a small overall drop in the number of applications for permits to fly through restricted areas (ED-R).

Table 6: Permits to fly through restricted areas (ED-R)

Year	Number
2010	112
2011	113
2012	117
2013	236
2014	315
2015	346
2016	408
2017	470
2018	431
2019	489
2020	477 (as of 16 November 2020)
Total 2010 - 2020	3.514

Source: BAF

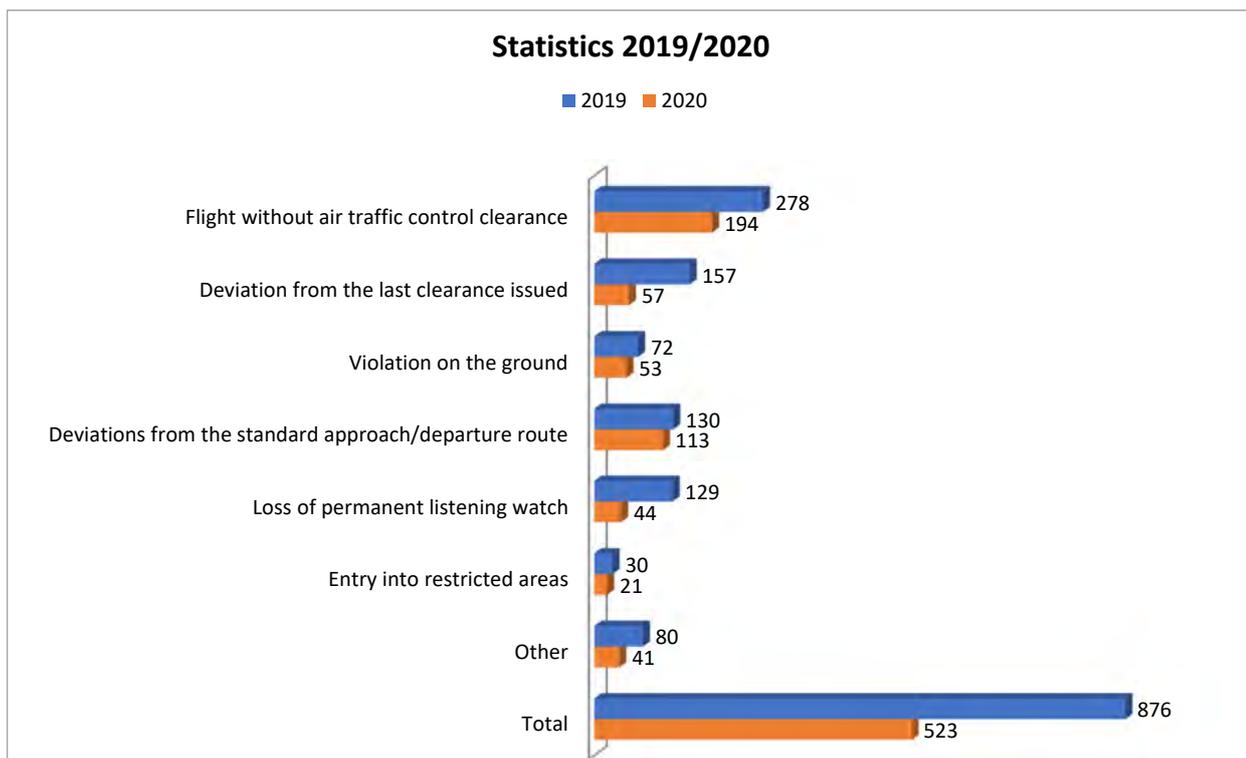
Administrative Offences in Air Traffic

Commission Implementing Regulation (EU) No 923/2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation (SERA) is the central set of rules within the EASA states governing the conduct of participants in air traffic. For the BAF, the legal basis for the prosecution of administrative offences in air traffic is therefore SERA

and the Aviation Regulation (LuftVO). The BAF initiates proceedings for the imposition of fines if there are facts that impair or endanger air traffic in an inadmissible manner. This is regulated by § 44 of the Aviation Regulation (LuftVO) in conjunction with § 58 paragraph 1 No. 10 LuftVG.

Diagram 2 below shows the administrative offences prosecuted by the BAF in 2019 and 2020 by type of offence.

Diagram 2: Administrative offences prosecuted by the BAF in 2019/2020 by type of offence



Source: BAF

Civil-Military Cooperation

Airspace outside the jurisdiction of military aerodromes is managed by integrated civil-military air navigation services. Within this framework, the BAF and the Federal Office of the Bundeswehr for Military Aviation (LufABw) cooperate through a Bundeswehr Liaison Office (VBB) to the BAF.

Visits and Topics at the Working Level

Colonel Bernhard Mayr came to the BAF in Langen at the beginning of 2019 for his first fact-finding visit as Chief of Branch 3 II "Unterstützung" (Support) at the Federal Office of the Bundeswehr for Military Aviation (LufABw). Branch 3 II "Unterstützung" of the LufABw is responsible for basic regulation and standardization in the area of the following specialist military tasks:

- Safety oversight of the air mission control service
- Regulation of military air traffic services, the tactical control service and flight dispatch services
- Aviation security, protective tasks
- Infrastructure for military flight operations

Colonel Mayr has been Chief of Branch 3 II in the LufABw since 1 October 2018 and thus the joint Bundeswehr Liaison Office (VBB) reports to him. Colonel Mayr is no

stranger to the BAF, as he had already had contact with the BAF during his previous assignment as Deputy Branch Chief in the Aviation Branch of the Federal Ministry of Transport and Digital Infrastructure (BMVI). This allowed his visit to expand beyond the scope of a mere inauguration visit. Among other things, targeted discussions were held with experts from the BAF on topics currently on the agenda at the LufABw in order to be able to better assess the processes already established at the BAF with regard to their transferability to the military sector.

In compliance with European and national requirements, Branch 3 IIa performs the safety oversight of military air traffic services (MilFS) and the tactical control service (TaktKtrDst). In these areas alone, there are many topics that affect both authorities equally. One example is the complex topic of the ATC Equipment Regulation (Flugsicherungs-ausrüstungsverordnung/FSAV). The BAF is responsible for checking the requirements of the FSAV. Due to military particularities (e.g. air traffic control technology in the area of military aircraft equipment), this requires ongoing discussions and coordination.

A special project, which is also handled by the LufABw (Division 3 "Flight Operations") and requires intensive coordination between the two authorities, is the full integration of unmanned aircraft systems (UAS) into German and European airspace. Here, civil-military cooperation is advanced through participation and active involvement in national and international bodies.



Colonel Bernhard Mayr (left) visiting the Director of the BAF, Prof. Dr. Nikolaus Herrmann, and Lieutenant Colonel Klaus Weinberg (right) at the beginning of 2019

Source: BAF

New Personnel at the VBB

The Bundeswehr Liaison Office (VBB) to the BAF was already established in 2006 and has accompanied the BAF since the beginning of the authority when it was built up from scratch by its activation staff. The aim of setting up the VBB was and is to harmonize the actions of both the civil and military supervisory authorities in the field of safety oversight of air navigation services in Germany against the background of European developments in the field of air traffic (SES).



The VBB consists of Chief Master Sergeant Roland Brucklachner (left) and the head, Lieutenant Colonel Stephan Götz-von Glatz (right)
Source: BAF

From the beginning, Lieutenant Colonel Klaus Weinberg as head of the VBB - together with Chief Master Sergeant Michael Beyer - was the central contact person for BAF employees in matters of civil-military cooperation. This cooperation, which has always been excellent and based on trust, was founded not only on professional expertise and extensive background knowledge but also, among other things, on the many years of personnel continuity in the VBB.

In the fourth quarter of 2020, new personnel was transferred to the VBB due to a reassignment and a retirement: Lieutenant Colonel Stephan Götz-von Glatz took over as the new head of the VBB on 1 October 2020. With the arrival of Chief Master Sergeant Roland Brucklachner one month later, the VBB has reached its target strength and can continue to actively support the BAF and advise it on military matters.

Internal Affairs of the BAF

10th Anniversary of the BAF

Retrospective View on a New Federal Authority and its Development

The Federal Supervisory Authority for Air Navigation Services (BAF) is essentially founded on the European Union (EU) regulations on the creation of a Single European Sky (SES), which came into force in April 2004.

A central component of the SES regulations is the functional separation between government supervisory tasks and the provision of air navigation services. To implement this separation, national air navigation supervisory authorities had to be established in the EU member states. The German Bundestag therefore transferred the corresponding tasks to a newly established higher federal authority, the Federal Supervisory Authority for Air Navigation Services (BAF), by law of 4 August 2009. Since then, the BAF has been primarily responsible for ensuring that air navigation service providers comply with the regulations and high safety standards that apply to them.

The programme for the creation of a Single European Sky was expanded in 2009 by the so-called SES II package, which contained a number of additional elements. Thus, a Europe-wide system of performance planning for air navigation services was introduced, the task of air traffic flow management, which had already been carried out by EUROCONTROL, was expanded into a comprehensive network management, the establishment of cross-state functional airspace blocks was made mandatory, and the tasks of the European Aviation Safety Agency (EASA) in Cologne were extended to include safety regulation in air navigation services. At the end of 2020, the EU started a new stage of further development with the kick-off of the SES II+ package. It remains to be seen how this will affect the position of the national supervisory authorities in the future.

As a result of the SES regulations, numerous changes have also been made in the German legislation since 2009.

Numerous adjustments affected and continue to affect in particular:

- The Aviation Act (LuftVG),
- The Aviation Regulation (LuftVO),
- The Air Navigation Services Personnel Training Ordinance (FSPersAV),
- The Ordinance on the Implementation of Air Navigation Services (FSDurchführungsV).

The establishment of the new higher federal authority was accompanied by a steady increase in staff. Thus, the number of employees rose to just under 90 in 10 years. As even more tasks are assigned because of the European regulatory framework, the actual target number has not yet been reached. The employees recruited for the BAF come from a wide variety of authorities and companies. However, people who are planning to start their careers are also regularly invited for interviews.

Ceremony for the Anniversary

The Federal Supervisory Authority for Air Navigation Services celebrated its founding ten years ago with a ceremony in Langen on 14 August 2019.

The former Director of the BAF, Prof. Dr Nikolaus Herrmann, welcomed more than 250 invited guests to the New Town Hall in Langen. Representatives of the Federal Ministry of Transport and Digital Infrastructure (BMVI), the federal and state transport authorities, the German Armed Forces as well as European institutions and the supervisory authorities of neighbouring countries attended the ceremony. From the air transport industry, numerous professionals from the DFS but also from other air navigation service providers as well as from airports and airlines took part. The associations of the air transport industry and the trade unions were also represented. Numerous former employees of the BAF also accepted the invitation.



Prof. Dr. Nikolaus Herrmann welcomes the guests to the Town Hall in Langen
Source: BAF

After the welcome address by Prof. Dr. Herrmann, the host and mayor of the city of Langen, Frieder Gebhardt, offered his congratulations. He looked back on the founding ceremony of the BAF in Langen's town hall and emphasized the importance of the city as a location for air navigation services and air traffic while also stressing the importance of air traffic for the city and the region.

Parliamentary Undersecretary Steffen Bilger came to Langen as the representative of the minister of transport and the parliamentary undersecretary responsible for aviation. He said that the BAF was a young and small authority within the area of jurisdiction of the ministry. However, it had been entrusted with an immensely important and highly complex task in 2009. Thanks to its staff under the leadership of Prof. Dr. Herrmann, it had gained great recognition and respect nationally and internationally. He emphasized that the recruitment and professional development of highly qualified specialists



Parliamentary Undersecretary Steffen Bilger of the Federal Ministry of Transport, Building and Urban Affairs (BMVI) during his welcoming speech on the occasion of the BAF's anniversary
Source: BAF

was very important for the BAF and was therefore a central concern of the entire department and its management. He wished the BAF that it would continue to carry out its tasks, which are so immensely important for air transport, at least as successfully as it had done so far.

The Managing Director of the DFS Deutsche Flugsicherung GmbH, Prof Klaus Dieter Scheurle, echoed the congratulations on the anniversary in his speech. Even though the BAF audits were sometimes "exhausting", it was important and good that the supervisory authority had existed since 2009. He emphasized that it was the common goal of operational air navigation services and state oversight to ensure the safety of air traffic and pointed out that there were areas, such as the design of flight procedures and the protection of facilities, in which the focus was not on oversight but on cooperation in a spirit of partnership, which, incidentally, functioned excellently in these areas.

The commander of the Federal Office of the Bundeswehr for Military Aviation, Major General Günther Katz, emphasized the very good civil-military cooperation. The Bundeswehr Liaison Office (VBB) to the BAF ensured that both military and civil concerns were always appropriately exchanged and coordinated during the oversight. This was also unique and exemplary at the European level and the results confirmed this fruitful constellation.

The importance of weather observation and the quality of the provided weather data for aviation was demonstrated by Hans Joachim Koppert, who as a member of the board of directors of the German Meteorological Service is responsible for its Weather Forecast Division. According to him, meteorological expertise in the BAF was an important element of its successful oversight and contributed to the fact that Germany was perceived as an important and competent player in the further development of European law in the field of aeronautical meteorology.

The BAF's close cooperation with other European supervisory authorities was demonstrated when representatives of the supervisory authorities of Luxembourg (Direction de l'aviation civile - DAC) and Switzerland (Bundesamt für Zivilluftfahrt - BAZL) addressed the guests. Luxembourg held the presidency of the Functional Airspace Block Europe Central (FABEC) Council then. For the DAC, Björn Schröder showed how this cooperation had continuously developed over the years and emphasized the importance of the expertise of the BAF's employees for the supervisory authorities of the other states. Dr Stefano Oberti from the Swiss Bundesamt für Zivilluftfahrt (BAZL) reported how relations between the two authorities had steadily developed into close and friendly cooperation, which, with the trilateral meetings with Austria, now extends beyond the borders of the FABEC.

The chairman of the Working Group of German Aircraft Noise Commissions, Thomas Jühe, thanked the BAF for its reliable way of taking the noise protection concerns of the population into account in its weighing decisions. According to him, the BAF was a competent point of contact when it comes to reconciling different interests even if the BAF itself could not influence the volume of air



Guests in Langen's town hall on the occasion of the BAF's anniversary ceremony
Source: BAF

traffic and the noise effects that are inevitably associated with it.

In his speech, Thomas Mayer, Managing Director of the Interest Group of Regional Airports (Interessengemeinschaft regionaler Flugplätze e. V.), confirmed that the BAF did not only focus on the 16 large international airports, but also on the regional airfields in Germany. He praised the good cooperation with the BAF at national and European level and wished for a stronger commitment with regard to ICAO.

The Director of the BAF, Prof. Dr Nikolaus Herrmann, thanked all speakers and guests for coming and for their congratulations. The speeches were both an encouragement and an incentive for him and for all BAF employees. Turning to the executive group of the Federal Ministry of Transport and Digital Infrastructure (BMVI), he assured them that the BAF would continue to perform its tasks with commitment and success in the future.

Organisational and Process Optimization

During the reporting period, intensive work was done on optimizing organisational structures and processes. After the years of setting up the authority, it became apparent in which areas the organisation and processes needed to be adapted to current developments.

Mission Statement of the BAF

At the beginning of 2019, the BAF, together with all employees, created a mission statement with a framework motto. The aim is to present and summarize the employees' common aspirations for external and internal action.

"Together, we work day after day to make air navigation services and air traffic safe and efficient.

By ensuring that all employees are highly qualified, we achieve excellent work results."

Authority Manual and Integrated Management System (IMS)

In the past two years, the BAF's authority manual and integrated management system have been comprehensively upgraded.

The authority manual describes the means and methods used by the BAF to fulfil the tasks assigned to it within the framework of national and European legislation and the tasks assigned by the BMVI.

The aim of the revision of the management system was to develop a process-oriented integrated management system (IMS) that integrated the various existing management systems and standards documents into one system. This management system will also be subject to continuous review and further development in the future. The new authority manual and the IMS also take into account new regulatory requirements. For example, new EU regulations, i.e. Commission Regulation (EU) 2015/340 and Commission Implementing Regulation (EU) 2017/373, have specified

and expanded the requirements for supervisory authorities. Among other things, they contain comprehensive requirements for the management systems of the supervisory authorities. All these aspects were taken into account in order to ensure and continuously develop the efficiency and quality of task fulfilment at a high level in the course of a continuous improvement process.

EASA Inspection at the BAF

The European Aviation Safety Agency (EASA) carries out regular inspections in the member states to verify whether the competent national authorities properly apply Regulation (EU) 2018/1139 (EASA Basic Regulation) and its implementing provisions.

From 24 to 26 November 2020, an EASA inspection in the area of "systemic enablers for aviation safety management" (SYS) took place for the first time at the BAF. The first part of this inspection had been conducted by the EASA on site at the Federal Aviation Office (LBA) from 9 to 13 March 2020. The planned subsequent on-site inspection at the BAF was initially postponed due to the SARS-CoV-2 pandemic and finally took place in the new form of "remote inspection" via video conference.

Inspections in this area include, on the one hand, overarching topics relating to the individual specialist tasks. For example, compliance with the demands on the management system is checked; these demands are based on the new Basic Regulation (EU) 2018/1139 and on general requirements for the authorities, e.g. those pertaining to the BAF according to Commission Regulation (EU) 2015/340 and Commission Implementing Regulation (EU) 2017/373. On the other hand, SYS inspections cover occurrence reporting and the procedures that determine how these reports are handled. The overall outcome of the inspection was positive. The results from the EASA inspection are now used to continuously improve the BAF's work.

IT and Digitalization

For the BAF's internal activities, the digitalization of the authority was a key topic in the 2019 and 2020 reporting period. This is related, among other things, to the IT consolidation in the federal administration as a central project of the federal government.

A whole series of measures and projects were due to be implemented or started in these two years. Among other things, the reorganisation of the cooperation with the central IT service provider of the federal administration, the Federal Information Technology Centre (ITZBund), should be emphasized. It is true that the operation of the BAF's IT had been managed by a central IT provider for the transport department since its foundation in 2009. However, the merger and consolidation of operations at the federal level have resulted in administrative and organisational changes that had to be implemented within the framework of a project at the BAF and which are still pending.

Another major project in 2019/2020 was the conversion of the operating systems and work interfaces of the electronic workstations to the latest versions of the software provider. Here, too, the project could still be completed despite the aggravating circumstances caused by the onset of the SARS-CoV-2 pandemic, so that since mid-2020 all computers of the BAF have been upgraded to the current work programmes and a modern operating interface.

Introduction of the Federal Electronic Record

In the framework of the so-called consolidation of services, the BAF decided in 2019 to introduce electronic recordkeeping with an integrated document management system (DMS) through the uniform product "federal electronic record" for the federal administration.

The basis for this is the regulation of § 6 EGovG (electronic recordkeeping), which stipulates that the federal authorities should keep their records electronically. If a record is kept electronically, suitable technical and organisational measures using state-of-the-art technology must be taken to ensure that the principles of proper recordkeeping are

complied with. A project group at the BAF prepared this project during 2020. The introduction of pilot processes in the BAF is planned for mid-2021, to be followed by the successive introduction throughout the entire authority. In preparation for this introduction of electronic records, the development of a uniform records plan for the BAF was already completed in 2019. In future, this records plan will not be organisation-related, but will structure the BAF's records within the electronic record with regard to fields of activity.

Personnel

Change of Leadership at the Top

At the end of June 2020, the first director of the BAF, Prof. Dr. Nikolaus Herrmann, was officially retired in Berlin by Undersecretary Dr. Tamara Zieschang of the Federal Ministry of Transport and Digital Infrastructure. Since the establishment of the BAF on 9 August 2009, Prof. Dr. Herrmann had been in charge of this new higher federal authority and the following milestones of his term of office are worth mentioning here:

- Establishment of a new higher federal authority whose tasks had been defined from scratch by the European SES regulations



The former director of the BAF, Prof. Dr. Nikolaus Herrmann
Source: Stefanie Kösling, BAF

- Recruiting staff for a highly specialised and complex field of tasks under the conditions of a general shortage of skilled personnel
- Building and establishing ties with other European supervisory authorities and neighbouring countries
- Technical support for the Federal Ministry of Transport and Digital Infrastructure (BMVI) through participation in and input to European Commission committees on the SES and involvement in the FABEC
- Technical and legal cooperation in national legislative procedures in air traffic and air navigation services

After a short period of vacancy, Dr. Karsten Baumann, a lawyer, took over the authority's leadership in Langen (Hesse). Previously, he had been Head of the Air Traffic, Permission and Plan Verification Division at the Hessian Ministry of Economics, Energy, Transport and Housing in Wiesbaden. However, Dr. Karsten Baumann already knew the BAF very well, as he had been involved in the establishment of the BAF as the national supervisory authority for civil air navigation services from its foundation in 2009 until July 2011. At that time, he had been head of the Airspace, Flight Procedures and Law



Dr. Karsten Baumann, the new director of the BAF since November 2020
Source: BAF

Branch (LFR) and had experienced the exciting start-up phase first-hand in a small team. At the beginning of his term of office, Dr. Baumann said that he would never have dreamed that he would one day succeed Prof. Dr. Herrmann as director.

Employment of Personnel

In the BAF's human resources area, 2019 and 2020 were characterized by a normal turnover due to retirements or reorientations in the staff base after the initial years of build-up. In 2019, 16 recruitment procedures were successfully completed. Of these, 10 positions were filled externally and 6 positions were refilled through internal reassignments. At the end of 2019, the BAF employed 87 people.

At the end of 2020, twenty recruitment procedures had been successfully completed for this year - despite the significantly more difficult external circumstances due to the restrictions imposed by the SARS-CoV-2 pandemic. Fortunately, it was possible to recruit personnel for 17 posts externally. In contrast, three posts were filled internally by reassigning staff. The workforce thus grew to a total of 98 employees in 2020. Integrating these new colleagues into their respective teams and training them for their specialist tasks was a considerable challenge for the individual sections of the BAF since much of the work was done from home then.

In terms of personnel recruitment, the focus is on being able to attract competent and well-qualified employees for the BAF's demanding tasks. Here, the BAF cooperates with technical universities and informs graduates of these institutions about employment opportunities at the BAF and in the federal administration.

To support the search for suitable specialized personnel, three organisational reviews and staffing needs assessment processes were conducted in the areas of the direction staff, the air navigation services personnel subject area in the SOP Branch and the Central Administration Branch (ZV) during the 2019 and 2020 reporting periods. As a result of these staffing needs assessment processes, additional staffing requirements were identified to fulfil the

authority's mission. The positions required for this purpose must be submitted to the federal budget via budget requests in the coming years in order to seek their approval.

Training and Advanced Training

One focus of training and advanced training is the professional integration of new colleagues and the continuous improvement of employees with regard to their professional knowledge as well as personnel development. For this purpose, the BAF has adopted a training and further education concept, which summarizes the various offers and opportunities for employees.

Auditors

One focus of this concept for the training and advanced training of employees is the qualification as auditors. This, as well as many other high-quality courses, is ensured for

the BAF by the EUROCONTROL Institute of Air Navigation Services (IANS) in Luxembourg. The continuous advanced training of employees is essential for providing high-quality safety oversight. In 2020, however, this area was also affected by the SARS-CoV-2 pandemic, as all seminars of the various educational institutions had to be cancelled from mid-March 2020. In-house training courses were also suspended to protect BAF employees.

Basic Courses as Web Seminars

Constantly updated in-house training courses are held, mainly for new employees, with a view to providing an introduction to all branches, their tasks and the associated legal and technical backgrounds. The aim is to provide an overview of the various task areas, responsibilities and activities of the organisational units in the BAF. Starting in the 4th quarter of 2020, these training sessions were conducted by means of video conferences.

Acronyms and Abbreviations

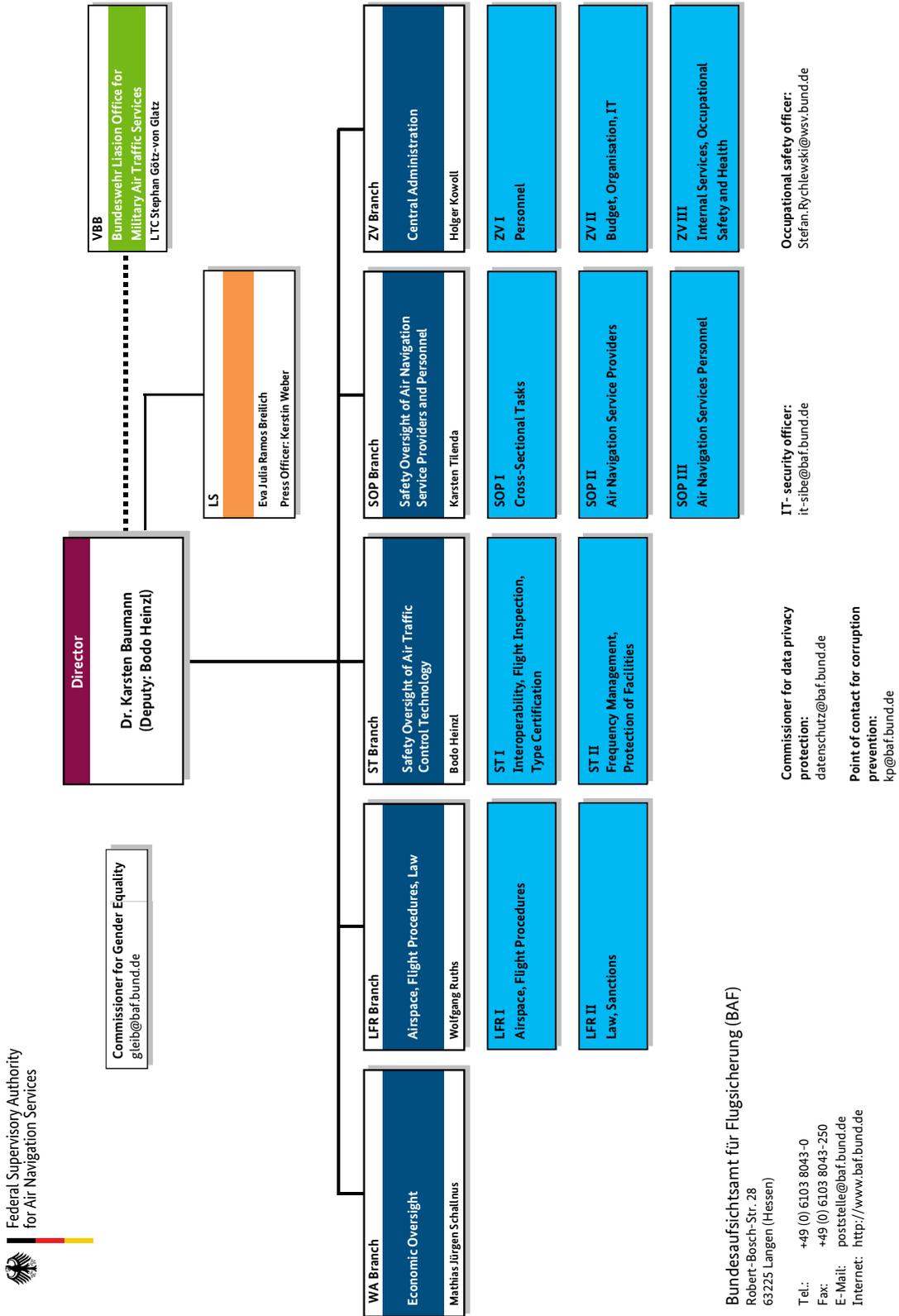
AeMC	Aero Medical Centre
ADS-B	Automatic Dependent Surveillance–Broadcast
AFIS	Aeronautical Flight Information Service
AFISO	Aerodrome Flight Information-Service Officer
AIRPROX	Aircraft Proximity
AIS	Aeronautical Information Service
AME	Aeromedical Examiner
ANS	Air Navigation Service Provider
APEG	Aircraft Proximity Evaluation Group
ASM	Airspace Management
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic System
ATSEP	Air Traffic Safety Electronics Personnel
BAF	Bundesaufsichtsamt für Flugsicherung (Federal Supervisory Authority for Air Navigation Services)
BMVg	Bundesministerium für Verteidigung (Federal Ministry of Defence)
BMVI	Bundesministerium für Verkehr und digitale Infrastruktur (Federal Ministry of Transport and Digital Infrastructure)
BMWi	Bundesministerium für Wirtschaft und Energie (Federal Ministry for Economic Affairs and Energy)
BVerwG	Bundesverwaltungsgericht (Federal Administrative Court)
CA	Competent Authority
CNS	Communication, Navigation, Surveillance
COC	Certificate of Competence
CTR	Control Zone
CVOR	Conventional VOR
DFS	Deutsche Flugsicherung GmbH (German Air Navigation Services)
DMS	Dokumentenmanagementsystem (document management system)
DVO	Durchführungsverordnung (implementing regulation)

DVOR	Doppler Drehfunkfeuer (Doppler VHF omnidirectional range)
EASA	European Aviation Safety Agency
EC	European Community
ED-R	Gebiet mit Flugbeschränkungen in Deutschland (restricted area in Germany)
EGovG	Gesetz zur Förderung der elektronischen Verwaltung (law on the promotion of electronic administration)
EGNOS	European Geostationary Navigation Overlay Service
ESV	Expanded Service Volume (expanded service catalogue for GBAS approach procedures)
EU	European Union
EUROCONTROL	European Organization for the Safety of Air Navigation
FAB	Functional Airspace Block
FABEC	Functional Airspace Block Europe Central
FPC	Financial and Performance Committee
FS	Flugsicherung (air navigation services)
FSMusterZulV	Flugsicherungsmusterzulassungsverordnung (Ordinance on the Type, Scope, Characteristics, Certification, Marking and Operation of Facilities and Equipment for Air Navigation Services)
Galileo	European global system for satellite navigation and timing
GBAS	Ground Based Augmentation System
GPS	Global Positioning System
HAC	Harmonisation and Advisory Committee
ICAO	International Civil Aviation Organization
IFG	Informationsfreiheitsgesetz (Freedom of Information Act)
ILS	Instrument landing system
IT	Information technology
ITZ Bund	Informationstechnikzentrum des Bundes (Federal Information Technology Centre)
kHz	Kilohertz
LBA	Luftfahrt-Bundesamt (Federal Aviation Office)
LufABw	Luftfahrtamt der Bundeswehr (Federal Office of the Bundeswehr for Military Aviation)
LuftVG	Luftverkehrsgesetz (Aviation Act)
LuftVO	Luftverkehrs-Ordnung (Aviation Regulation)
MET	Meteorology

MHz	Megahertz
MUAC	Maastricht Upper Area Control Centre
NAV	Navigation
NCP	NSA Coordination Platform
NfL	Nachrichten für Luftfahrer
NM	Nautic miles
NSA	National Supervisory Authority
OVG	Oberverwaltungsgericht (higher administrative court)
PRB	Performance and Review Body
PTB	Physikalisch-Technische Bundesanstalt (Federal Standards Laboratory)
RP	Reference Period
RPAS	Remotely Piloted Aircraft Systems
RTCA	Radio Technical Commission for Aeronautics
SBAS	Satellite Based Augmentation System
SERA	Standardised European Rules of the Air
SES	Single European Sky
SESAR	Single European Sky ATM Research
sFSB	sonstiges Flugsicherungspersonal (other air navigation services personnel)
SSC	Single Sky Committee
TWR	Tower
UAS	Unmanned Aircraft Systems
UIG	Umweltinformationsgesetz (Environmental Information Act)
VBB	Verbindungsbüro Militärische Flugsicherung (Bundeswehr Liaison Office for Military Air Traffic Services)
VDB	Very High Frequency (VHF) Data Broadcast
VG	Verwaltungsgericht (administrative court)
VGH	Verwaltungsgerichtshof (higher administrative court)
VOR	VHF omnidirectional range
VHF	Very High Frequency
WG	Working Group

Organisational diagram

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