




Federal Supervisory Authority  
for Air Navigation Services

# Figures, Data, Facts Report of the Federal Supervisory Authority for Air Navigation Services 2017/2018





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# Word of Welcome

## Dear readers,

This annual report is intended to inform you about the activities of the past two years. The brochure focuses on topics standing out from daily business.

Most of the tasks of the Federal Supervisory Authority for Air Navigation Services (German acronym: BAF) are governed by uniform European regulations which have undergone extensive amendments. From the beginning of 2017, new regulations for air traffic controllers have been adopted which led to considerable changes. There were also amendments to the basic regulations on safety oversight and performance planning in air navigation services which shall be applied from 2020. The BAF took an active part in these amendment procedures.

The working practices of the authority are reviewed regularly by third parties, this time by the European Aviation Safety Agency (EASA), the International Civil Aviation Organisation (ICAO), the Federal Court of Auditors and the Federal Commissioner for Data Protection and Freedom of Information.

We maintain close cooperation with partner authorities in Germany's neighbouring countries and also welcomed delegations from Georgia and Ukraine, from Japan and Brazil. BAF personnel are involved in various bodies and working groups at European and international level. At the AERO Global Show for General Avi-

ation, the BAF has been represented with speeches for a long time. Presentations at international conferences complement our specialist and public relations work.

When looking at the external situation, the internal situation at the authority should not be disregarded. Despite the increasing shortage of skilled professionals, further posts could be filled and we are still looking for qualified personnel. Work-life balance is also important to us.

Get an overview of the BAF's activities of the past two years. I hope you enjoy reading our report

*Dr. Nikolaus Herrmann*

Prof. Dr. Nikolaus Herrmann  
Director of the BAF



# Safety Oversight

## Air Navigation Service Providers and Personnel

### Air Navigation Service Providers in Germany

Air navigation service providers and their personnel ensure safe, orderly and smooth air traffic flow both at airports for take-offs and landings and in the air. They are supported by technical ANS systems and installations to facilitate proper air traffic management. The following table lists all air navigation service providers certified by the BAF that were operating in Germany in 2017 and 2018 (with the exception of Aeronautical Flight Information Services (AFIS) provided at 23 small airfields).

Table 1: Certified air navigation service providers in Germany in 2017/2018		
Air navigation service provider	Air navigation service	Training
Airbus Operations GmbH	ATS	Unit training
Austro Control GmbH	ATS	Unit training
BAN 2000 GmbH	CNS	
Deutscher Wetterdienst (DWD)	MET	

Table 1: Certified air navigation service providers in Germany in 2017/2018		
DFS Deutsche Flugsicherung GmbH	ATS, AIS, CNS	Basic and unit training
DLR Gesellschaft für Raumfahrtanwendungen (GfR) mbH	CNS	
EUROCONTROL Maastricht	ATS, CNS	Unit training
DFS Aviation Services GmbH (DAS)	ATS	Unit training
Rhein-Neckar Flugsicherung GmbH (RNFG)	ATS	Unit training
EUROPEAN SERVICE PROVIDER FOR AIRPORTS (ESPA) GmbH	CNS	

Source: BAF

### Reporting System for Safety-Related Incidents

Air navigation service providers are obliged to report safety-related incidents, so-called occurrences, to the BAF. The aim of the reporting system is to enhance air traffic safety. To this end, potential vulnerabilities in the overall aviation system are analysed and

improvement measures are identified. In the second half of 2017, the reporting system was completely switched over to the Europe-wide ECCAIRS reporting system. On the one hand, this simplified the exchange of occurrence reports with air navigation service providers and other authorities and made it more efficient. On the other hand, it is now possible through direct access to the database to conduct evaluations and analyses on a daily updated basis. Furthermore, the changeover is an important aspect for complying with Regulation (EU) No 376/2014 which is fundamental to the reporting system.

The intensification of cooperation with the Federal Aviation Office (LBA) allowed processes to be established in the interfaces of the two authorities. A working agreement between the Federal Aviation Office (LBA) and the BAF concluded in 2019 regulates the details of this cooperation. Among other things, it defines the responsibilities for certain types of reportable occurrences and sets out the procedure for reviewing and merging multiple reports. Regular working meetings deal with the continuous improvement of interface processes. In future, a key component of the collaboration shall be the joint identification of risk areas and the initiation of appropriate corrective action.

At national level, occurrence management is also part of the work on a German aviation safety programme. The principles of reporting accidents, interference and occurrences are laid down in the annex to this programme to which the BAF contributes. Its

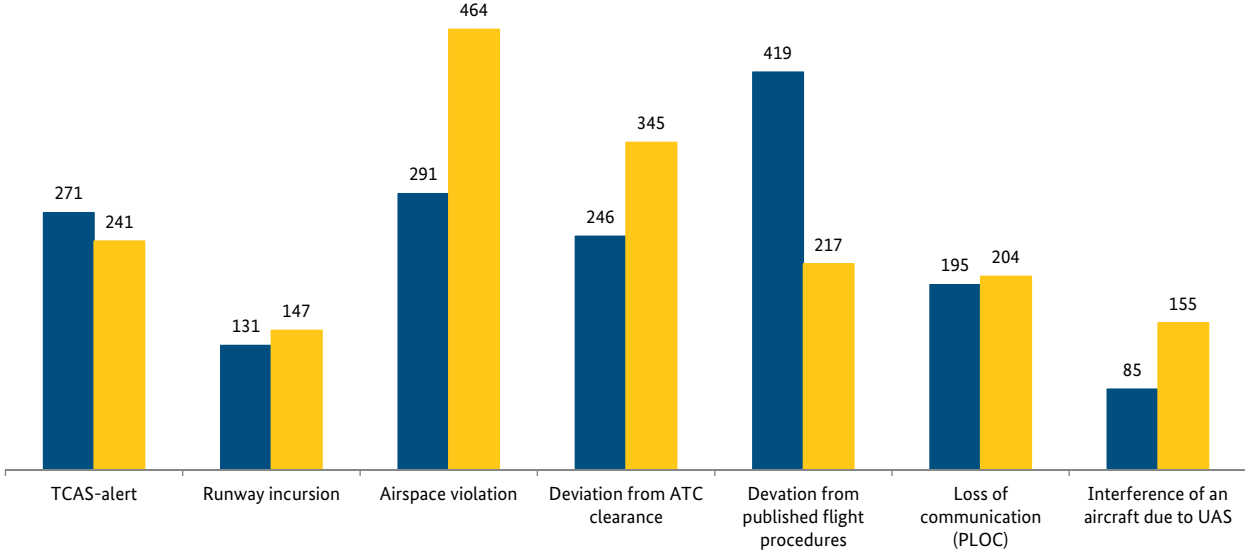
central topic is the implementation of a united German database that can be used by all competent authorities.

At international level, too, there is an in-depth exchange on the issue of occurrences. The responsible points of contact of the European authorities meet twice a year to exchange experiences of safety-related occurrences at European level under the chairmanship of EUROCONTROL. For the statistical evaluation, the internal BAF numbering has been adapted from 2017 to the numbering used by EUROCONTROL for its reports. If occurrence reports include several consecutive safety-relevant occurrences, each individual occurrence is recorded in the database. Thus, the total of all individual occurrences does not match the total number of reported occurrences registered in the BAF database which contains 8,698 occurrence reports for the years 2017 and 2018 (2017: 3,988, 2018: 4,716). Some selected occurrence types – which are particularly relevant for air navigation services – are described in detail in the following statistics.

### **Air Navigation Services Personnel**

The BAF issues the licences for air navigation services personnel (air traffic controllers, flight data handling personnel, personnel working in flight information services, personnel working in aeronautical information services and technical air navigation personnel). Since 1 January 2016, the BAF has also issued the certificates of capability for civil air traffic controllers (so-called “COC”) for conducting control services for operational air traffic (especially military aircraft) at the German control centres and the Maastricht

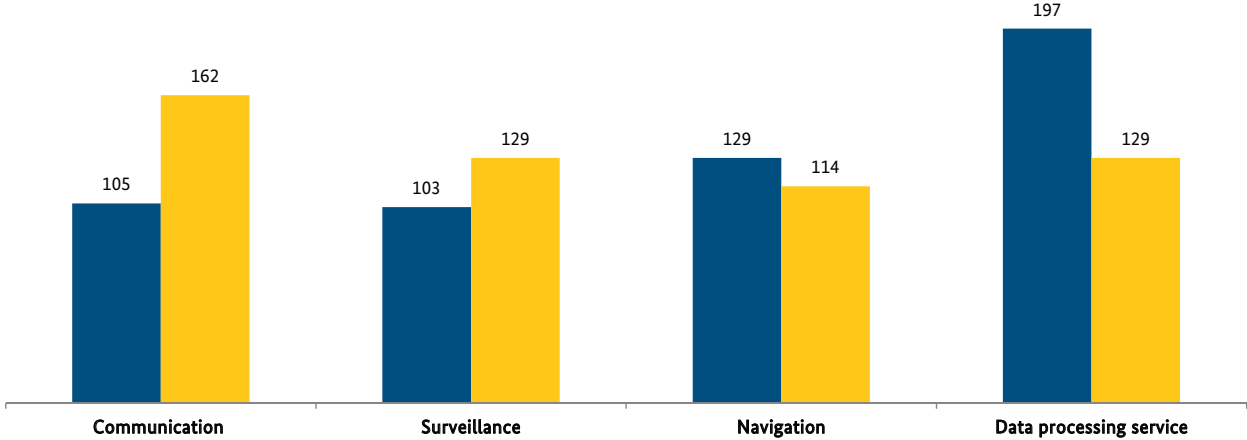
**Reported air traffic incidents 2017/2018**



Source: BAF

■ 2017 ■ 2018

**Reportet Technical incidents 2017/2018**



Source: BAF

■ 2017 ■ 2018

UAC. Since early 2017, licences have also been issued to personnel working in the Aeronautical Flight Information Service (AFIS).

Since 1 January 2017, licences for air traffic controllers have been issued based on the new European Regulation (EU) 2015/340 laying down technical requirements and administrative procedures relating to air traffic controllers' licences and certificates. This regulation increases the requirements for air traffic controllers and air navigation service providers. The requirements for air traffic controllers relating to training, licensing and medical fitness are described in more detail in the annexes to Regulation (EU) 2015/340. Since there are opportunities to make the training and employment of air traffic controllers more flexible, air navigation service providers had to revise many of the training documents for air traffic controllers or prepare new ones and submit them to the BAF for approval.

The BAF processed some 18,000 licence applications in 2017 and some 8,000 licence applications in 2018. Around 600 new licences were issued in 2017 and 2018 respectively. A total of around 17,000 ratings, authorisations and notes were extended in 2017; they numbered around 6,000 in 2018.

From 2017 to 2018, the BAF reviewed four training providers of initial and follow-on training for air traffic controllers. In addition, the academy of DFS Deutsche Flugsicherung as an independent certificate holder was supervised. Besides the certification for the basic training of air traffic controllers, the academy holds two certificates for the training of technical air navigation personnel and

other air navigation service operating personnel in accordance with the Regulation on ANS Personnel and their Training (FSPer-sAV). The relevant certificates were also issued to Rhein-Neckar Flugplatz GmbH for advanced and further training of flight information services personnel in May 2018.

In September 2017, the DFS Academy and DFS Aviation Services received their certificates as language proficiency examination agencies. These two certificates are also supervised by the BAF.

Furthermore, the new European Regulation (EU) 2015/340 revises the requirements for the medical examination of air traffic controllers. It has adopted the requirements of ICAO Annex 1 which have already been applied in the member states. However, challenges arose because the requirements for the examination process and the oversight function of the state were more comprehensive to ensure the uniform application and mutual recognition in Europe.

During the two inspections carried out by the EASA in licensing and aviation medicine in 2017, the European auditors were able to satisfy themselves that the requirements and provisions of Regulation (EU) 2015/340 are implemented in the Federal Republic of Germany.

The licence management database (so-called "LiMa") which the BAF put into service in 2015 is continuously developed and adjusted to requirements. LiMa contains a comprehensive reporting and analysis module which is able to prepare standard analyses and statistics for the European Commission and its different insti-



tutions, particularly for the EASA, in accordance with the requirements. The management of the aeromedical examiners (AME) approved by the BAF and the aeromedical centres (AeMC) has also been extended and optimised.

Since 2017, the BAF has conducted inspections on site and as desk-top audits based on a new supervisory management concept in aviation medicine (Class 3). Furthermore, aeromedical examiners (AMEs) are required to demonstrate training and competence to the BAF on a regular basis. For this purpose, the BAF approves the training measures and evaluates them according to a uniform system. Aeromedical expertise is contributed by three medical assessors of the BAF.

The German version of Regulation (EU) 2015/340 originally published in the Official Journal of the EU contained numerous translation errors. In close cooperation with the competent authorities in Austria and Switzerland, key passages of the regulation were correctly retranslated and sent to the European Commission for amendment. The accompanying and explanatory regulations by the EASA (AMC and GM) for the medical field which were prepared in English only were translated into German and provided to aeromedical examiners.

The training of technical air navigation personnel was extended to include the possibility of adapting to the requirements of EUROCONTROL Specification 132. This leads to the harmonisation with other European states and the introduction of Implementing Re-

gulation (EU) 2016/1377 (in the meantime superseded by Regulation (EU) 2017/373).

The other air navigation service operating staff working in aeronautical information services, flight data handling and flight information services were increased by aeronautical flight information service (AFIS) personnel. With the certification of AFIS providers, licensed personnel were included in the licensing system. Thus, these personnel are subject to the requirements of the Regulation on ANS Personnel and their Training (FSPersAV) regarding the qualification approved and supervised by the BAF.

Supplementary Agreement on Aviation Medicine with the Federal Office of the Bundeswehr for Military Aviation (LufABw)

On 7 June 2017, the Director of the BAF, Prof. Dr. Nikolaus Herrmann, and his then military colleague from the Federal Office of the Bundeswehr for Military Aviation (LufABw), Major General Dr. Ansgar Rieks, signed a supplementary agreement on the cooperation of the two offices in the field of aviation medicine at the official seat of the authority in Cologne.



Major General Dr. Ansgar Rieks (left) and the Director of the BAF, Prof. Dr. Nikolaus Herrmann, at the LufABw signing the agreement

This agreement was prepared by the liaison office (VBB) of the two authorities which is located at the BAF. It supplements the basic agreement concluded between the offices as early as 2015 by the cooperation of the two supervisory authorities in the field of aviation medicine. In military aviation, the provision of medical care for licensed personnel by own personnel has been standard practice for decades. Accordingly, the LufABw, as a military aviation authority, also has medical personnel for the organisation and supervision of medical fitness matters. The BAF, however, has no own medical staff but ensures this capability by the contractual cooperation with qualified specialists, among others from the LufABw. On request, the Directorate of Bundeswehr Aviation Medicine at

the LufABw assists the BAF as an aeromedical expert in medical tasks on the basis of the agreement made. In return, the LufABw can draw on the expertise of the BAF, for example, for initial and follow-on training of medical personnel, e.g. aeromedical examiners, set out in EU regulations. This training encompasses not only medical matters but also administrative cooperation of examining doctors and supervisory authorities.

### Revision of the Aeronautical Information Publication (AIP)

During the inspection by the European Aviation Safety Agency (EASA) at the BAF and during the audit of the International Civil Aviation Organisation (ICAO) at the Federal Ministry of Transport and Digital Infrastructure (BMVI), a lack of topicality was identified in the German Aeronautical Information Publication (AIP). Therefore, the BAF established the “AIP Clean-up” project in close cooperation with the BMVI. The aim was to inform and sensitise all competent authorities and to achieve the revision of the relevant chapters in the AIP. The project was implemented in three steps:

1. Formal optimisation of the AIP
2. Content related optimisation of the AIP
3. Continuous review of the AIP in accordance with the process scheme (from 2019)

The Federal Ministry of Transport and Digital Infrastructure, the Federal Aviation Office, DFS Deutsche Flugsicherung, the Bundeswehr and the aviation authorities of the states were invited at the

inaugural meeting on 10 April 2018. Project step 2 was concluded with the following results:

- 138 AIP topics were identified and processed by the responsible persons of contact
- There was no need for change for 83 AIP topics (60.14%)
- 38 AIP topics (27.54%) had to be revised, 17 of which are still to be processed (12.32%) (as of: end of December 2018)

## ATC Technology

### Flight Calibration Project with the PTB Successfully Completed

In 2018, a multiannual cooperation programme was concluded with the Physikalisch-Technische Bundesanstalt (PTB), the national metrology institute. The PTB has, among other things in the course of that cooperation, developed a sensor for the Flight Calibration Unit for measuring the electric field strength of radio navigation facilities. This sensor is used to calibrate a reference volume to validate the measurement conducted by the flight calibration service provider. This has established the conditions for verifying whether the calibration carried out by calibration equipment and aircraft is correct or not in accordance with the DIN EN 17025 comparison.

Flight calibration service providers use calibration aircraft for the regular calibration of ILS and glide angle localisers of instrument landing systems. The comparison consisted of two parts. On the one hand, a reference signal was emitted from the PTB site in Braunschweig and calibrated by the service providers. On the other

hand, landing approaches at the Braunschweig-Wolfsburg research airport were recorded using the relevant flight calibration system of calibration aircraft and compared with the results of the PTB.

This has proved that the flight calibration service providers meet the ICAO requirements or tend to assess the range of ILS localisers against the requirements too strictly. This was particularly apparent in cases where measurement methods were used which apply an optimised procedure with regard to the time needed for calibration (flights on circle segments instead of the standard measurement method through flights towards the ILS localiser antenna). This is not a safety risk but in some cases leads to a limitation of instrument landing systems. With the procedure developed by the PTB on the initiative of the BAF, the calibration of calibration aircraft can now be checked and adjusted for these arc or orbit flights too. The calibration results shall be considered accordingly by flight calibration service providers when selecting and conducting calibration flights on circle segments – or radial approaches.



A GBAS system at Bremen airport

### **Type Certification of GBAS Ground Stations (Bremen & Frankfurt)**

In Bremen and Frankfurt, DFS Deutsche Flugsicherung GmbH operates the GBAS SLS-4000 CAT I (GAST C) ground stations by Honeywell. The GBAS system enables approaches using satellite navigation, i.e. independently of conventional ground-based instrument landing systems by transmitting an additional signal that compensates for inaccuracies of the satellite signal (GPS or Galileo). The initial certification of GBAS SLS-4000 was in 2011 with Version Block 0. Version Block I was certified in 2014. In the reporting period, the certification for Version Block II is underway.

The basis for the current rating and the current certification process is the system design approval (SDA) of the US supervisory authority FAA. Block II received the SDA in October 2015. The work and examinations carried out by the FAA for the SDA are recognised by the BAF. The examination of the type certification focuses on the verification of the remaining difference between FAA requirements and German NfL II-51/08 requirements.

To support the implementation of the type certification process, the DFS Aviation Service (DAS)/DFS was involved as an independent expert by Honeywell. The independence of the DAS/DFS certifying staff is ensured by applying the criteria of DIN EN ISO/IEC 17020. The DAS/DFS examination experts conduct a compliance evaluation for Honeywell based on the supporting documents to assess compliance with NfL II-51/08 requirements.

Besides software changes (among other things for improving service availability, the Signal Quality Monitor and processing options of the Measured Site Data Process), the GBAS SLS-4000 Block II Update encompasses the optional use of an SBAS receiver kit with antenna. This is used for real-time ionospheric monitoring and for limiting the ionospheric residual error.

The use of the optional SBAS receiver kit creates the conditions needed for CAT II operation with CAT I ground station equipment. Since the use of this option is currently only approved for the American SBAS System WAAS, further analyses of the type certification shall be carried out for operation with the European SBAS System EGNOS. A working group conducted corresponding exa-

minations and analyses in the SESAR Project AAL 2 (Advanced Approaches to Land 2) which are used by Honeywell for verification. The certification process for Block II was completed in the second quarter of 2019. Appropriate approach procedures for CAT II operation in Bremen are under preparation.

### Frequency Management – Changeover to 8.33 kHz in Europe

Due to the increasing need for radio channels, the European Commission issued Implementing Regulation (EU) No. 1079/2012 laying down requirements for voice channels spacing for the single European sky as early as 2012. The aim of this regulation is the changeover of channel spacing in VHF radio communication (117.975-137 MHz) from 25 kHz to 8.33 kHz in order to achieve – with some limitations – a threefold increase in the number of frequencies available. According to the regulation, this changeover should be completed by 31 December 2018 at the latest. The information campaign for general aviation initiated in 2016 for this purpose was intensively promoted in 2017 and 2018 in cooperation with the Federal Network Agency (BNetzA). The frequency users concerned were sensitised and informed by corresponding information in press releases, magazines, flyers and presentations at public expert events as well as articles on the BAF website.

In 2017, 923 frequencies were set for air navigation services and general aviation by the BAF in the area of radiotelephony and radio data transmission. Furthermore, time-critical coordination requests from European neighbouring states were processed and the national frequency management database was revised with regard

to current data material. In 2018, another 1,680 frequencies were set for air navigation services and general aviation by the BAF in the area of radiotelephony and radio data transmission.



View into the cockpit of an aircraft with technical equipment for the communication between the pilot and ground staff

The international ICAO register for Germany was gradually revised in accordance with the relevant guidelines of the Network Manager and then amended. On 30 October 2018, 1,180 8.33 kHz frequencies were already recorded in the international register. In the function of national frequency manager, the BAF converted the remaining 565 internationally coordinated frequencies to the new channel spacing on 20 December 2018.

Thus, Germany holds a top position in the changeover of channel spacing from 25 kHz to 8.33 kHz among the European states. All

change requests were processed. From 1 January 2019, frequencies in VHF radio communication (117.975-137 MHz) may only be used on the frequencies in 8.33 kHz channel spacing. The frequency band congestion was considerably reduced by changing the channel spacing, thus increasing the availability of free frequencies.

A noticeable result from the channel spacing reduction could be achieved in cooperation with the German gliding association as early as 2018. This made it possible, due to the resources released, to respond to the association's request to provide general aviation with three frequencies for air-to-air communication which, in contrast to the former division, could be used by all sport pilots in order to improve gliding safety.

### Protection of Air Navigation Facilities

Structures near technical air navigation facilities may impair their proper functioning. The facilities therefore have restricted areas around them where structures may only be erected upon the BAF's approval.

On its website, the BAF also provides an interactive map of building-restricted areas for the general public which can be used to determine whether a planned structure is situated in- or outside the two-dimensionally displayed building-restricted areas of one or more air navigation service facilities.

For processing applications in accordance with § 18a of the German Civil Aviation Act, the BAF has used a web-based geoinformation database (GIS) application since mid-2012. This so-called

“AWplus” web application serves mainly to simplify the processing of such requests with the persons and authorities concerned (regional aviation authorities, air navigation service providers and private individuals). The web application is continuously improved and adapted to changing requirements. With the amendment of § 18a of the German Civil Aviation Act on 2 July 2017, the BAF is required to publish the locations of all the air navigation service facilities and the building-restricted areas around them where interference caused by structures is to be expected. The AWplus system automatically generates a standardised document and sends it to the *Bundesanzeiger* (Federal Gazette) for official publication.

The aviation authorities of the federal states report the structures planned in building-restricted areas in accordance with § 18a of the German Civil Aviation Act to the BAF. The AWplus system supports communication for all agencies involved and has automatically generated the formal framework for the BAF's decision since the 3rd quarter of 2017. Furthermore, the BAF's decision is automatically sent to the approving authority.

In its capacity as a public institution, the BAF is increasingly called upon by public agencies to participate in planning processes relating to zoning, land use as well as spatial and regional development, etc.

Besides AWplus detail improvements and the provision of the FAQ website, 2018 started with the optimisation of the work processes resulting from the BAF's participation. For this purpose, the measures planned for 2019 provided for, besides map improvements,

the automatic entry of the coordinates of an area and the treatment of several areas within one process by importing a coordinate list.



The Doppler VHF Omnidirectional Range (DVOR) Ried near Darmstadt is an important air navigation service facility for Frankfurt Airport

# Audit Management

A central task of the BAF is the continuous safety oversight over air navigation services. To this end, audits and on-site inspections are conducted at the air navigation service providers' premises with regard to the provision of air navigation services, air navigation services personnel and air traffic control technology. Besides so-called desktop audits, where documents and reports requested by air navigation service providers are examined, audits are regularly conducted by the BAF at the service providers' facilities. These include not only the area control centres for supervising air traffic in the lower and upper airspace and the control towers at the relevant international and regional airports and special airports but also technical air navigation systems.

## Basis and Background

The audits are based on European regulations and international agreements as well as national requirements from laws, regulations and guidelines. The aim is to examine whether the provision of services by air navigation service providers and the technical systems needed for this meet the legal requirements. For the deviations and observations identified during these audits, corrective measures are developed by the air navigation service provider concerned, agreed with the supervisory authority and later checked for their correct implementation.

In this respect, it is not only important to examine the compliance of individual requirements but also to show air navigation service providers where improvements are possible so that they do not only maintain the status quo of the safety and quality of their services but also continuously increase and improve them.

It is also important to gain an overall impression of air navigation service providers in order to early detect possible deficiencies in safety and quality. For this purpose, the auditors of the BAF work together in an interdisciplinary team in the planning, preparation and implementation of audits. The results from the audits are continuously evaluated to draw conclusions for future audits. It is not only the aim to further develop supervision over air navigation service providers but also to continually improve the audit system of the BAF internally.

In the framework of international cooperation, auditors from other states, especially from Germany's neighbouring countries, also participate in such audits. Conversely, auditors of the BAF also participate in audits abroad.



## Audits of the Financial Performance of Air Navigation Service Providers

To be able to render services permanently and with the required quality, air navigation service providers have to be economically effective. This aspect is also reviewed by the BAF during audits.

### Auditing of Air Navigation Service Facilities

The focus of safety oversight over air navigation service facilities is on the locations of technical systems such as radio, navigation and radar systems. Safety oversight also includes centralised processes at other locations such as maintenance and administrative work.

### Flight Calibration Audits

Flight calibration audits serve to check whether the requirements of applicable provisions are monitored, implemented and complied with and whether the providers' processes facilitate regulation-compliant flight calibration. In the first half of 2018, two air navigation service providers as well as several providers of communication, navigation and surveillance services were audited.



Calibration aircraft before taking off to a calibration flight

## Audits of Air Navigation Service Providers and their Personnel

The following table provides an overview of the audits carried out in 2017 and 2018.

Table 2: Audits and Inspections		
Area Audited	2017	2018
General Requirements	8	14
ATS	19	20
CNS	6	19
AIS	2	3
MET	4	5
AFIS	12	8
TO	7	17
ATFM/ASM	17	2
MED	29	47
LAB	2	3
Total	106	138

Source: BAF

# Economic Oversight and Performance Planning

European law provides for member states to establish plans for a period of five years to improve air navigation services in the areas of safety, capacity, environment and cost efficiency. The basis for these plans are Europe-wide objectives set by the EU Commission upon agreement of the member states. The achievement of these objectives is monitored by national supervisory authorities, corresponding reports are sent to the EU commission.

## Reference Period 2 (2015-2019)

In 2017 and 2018, the focus was on the supervision of the performance plan for 2015-2019 and reporting to the EU Commission. This performance plan was established as the joint plan of the Functional Airspace Block in Europe Central (FABEC) where France, Belgium, the Netherlands, Luxembourg, Switzerland and Germany work closely together. Accordingly, there also was close cooperation in reporting to the EU Commission.

### Key Performance Areas

In the performance area of environment, the length of the flight track is analysed, and it is measured to what extent the actual flight track deviates from the shortest flight track (great-circle distance) and thus unnecessary detours are flown outside the terminal control areas of airports.



The European states want to make air navigation systems more efficient through performance planning so that airspace users will receive high quality for adequate fees in future.

However, this deviation can never be zero because detours can never be avoided due to the density of traffic or weather conditions (e.g. thunderstorm).

In 2017, the FABEC value for the so-called horizontal en-route efficiency considerably improved although it continues to be 0.9 percentage points below the FABEC target value of the performance plan. The performance plan provides for the actual flight tracks to deviate only by 3.14 % from the relevant great-circle distances on average in the course of a year.

Terminal user charges and route charges have been considerably reduced again as from 2017. Compared with the previous year, 2017 thus showed a route (terminal) charge rate of 69.36 (130.59) euros per service unit which decreased by 16 % (18 %). In 2018, the national route charge rate was 67.07 euros and the terminal charge rate was 127.87 euros. The main reason for the decreased charge rates are equity increases at DFS Deutsche Flugsicherung GmbH and assumption of costs by the federal budget as well as offsets of additional revenues due to the positive traffic development in the previous years.

The performance area of capacity presented particular difficulties in 2017 and 2018. Measurements included the delays caused by air traffic control. Especially the summer months of 2018 were characterized by sometimes dramatic delays in air traffic which, however, were only partly caused by air traffic control.

In 2017, the FABEC value for en-route flights deviated by 0.73 minutes per flight (+174 %) from the FABEC target value of 0.42 minutes per flight. This resulted in a financial malus in the context of the incentive scheme developed in the FABEC. To counteract this delay development, causes were analysed and measures taken at numerous levels. Meetings were held between all FABEC representatives and the Performance Review Body (PRB), a support panel of the EU Commission, as well as between the PRB and the BAF separately. There were also regular meetings with DFS Deutsche Flugsicherung GmbH about the causes, the planned and current projects as well as the current and predicted development of delays. The per-

formance target for arrival delays measured at national and airport levels, however, was reached in 2017 so that DFS received a corresponding bonus.

### Reference Period 3 (2020-2024) of Performance Planning

At the end of 2018, extensive changes to the performance planning and charge system were agreed upon for Reference Period 3 (2020-2024). These were preceded by intensive preparations in which the BAF participated to a significant extent. Proposals and draft regulations of the EU Commission were critically reviewed and technically assessed. In addition, evaluations of other states were critically appraised and the FABEC views were consolidated. The EU Commission initiated numerous studies and workshops in which the BAF participated, and published reports and impact assessments which the BAF had to evaluate. Topics included the effectiveness of incentive mechanisms, effects analyses for proposed legal amendments, the exact identification of the cost basis for air traffic control charges and the evaluation of target bandwidths. The new legal basis for the third reference period was adopted after intensive negotiations at the relevant advisory committee of the EU Commission (Single Sky Committee – SSC) with the approval of the member states in December 2018.

### Air Traffic Control Charges

Every year, airspace users are consulted on the amount of air traffic control charges. Although these charges are already set together with the performance plan in the context of performance plan-

ning, they are subject to annual changes, for example, due to bonus or malus payments, inflation adjustments or the traffic risk sharing mechanism. Therefore, the BAF holds oral and written user consultations on route charges and terminal user charges in the final quarter of a year at the latest. These consultations provide airspace users with an opportunity to ask questions and make comments.

At the European level, the EUROCONTROL Enlarged Committee for Route Charges holds annual consultations on route charges in which the BAF also participates.



With the air traffic control charges, airspace users contribute to the financing of the air traffic control system

# Airspace, Flight Procedures and Law

## Lawsuits Due to the Establishment of Flight Procedures

In 2017 and 2018, the number of lawsuits on the establishment of flight procedures further decreased. While in 2013 and 2014 more than 20 lawsuits were pending at the same time, the number was reduced to two by the end of 2018. One lawsuit concerned the so-called southern fly-around route in Frankfurt before the Hessian Higher Administrative Court (VGH) in Kassel. The second lawsuit concerned the so-called Wannsee route at the future Berlin Brandenburg Airport (BER) before the Higher Administrative Court (OVG) Berlin-Brandenburg. In early 2019, the new hearing took place before the Hessian Higher Administrative Court in Kassel concerning the southern fly-around route.

In September 2017, proceedings took place for the second time before the Higher Administrative Court Berlin-Brandenburg concerning the Wannsee route at BER. The main subjects were crash risks which, according to the plaintiffs, are posed by aircraft and the resulting risk of severe incidents at the BER II research reactor (Berlin experimental reactor II) of the Helmholtz Zentrum Berlin in Berlin Wannsee. Potentially affected communities and residents claimed that radioactivity could be released from the BER II by an accident-related aircraft crash or terrorist act.



The Hessian Higher Administrative Court in Kassel

The court obtained an expert report for determining crash risks and decided after two-day proceedings that the flight procedures in question were lawful. The crash risks claimed by the plaintiffs were so low that they should be classed as ordinary risks of life (so-called residual risk) because they were beyond practical reason and as socially adequate loads were to be borne by all citizens. Terrorist risks could neither be avoided nor significantly influenced by the flight procedure. The litigious flight procedures were not objectionable even under noise protection aspects. The complaints lodged

against the non-allowance of any appeal were rejected by the Federal Administrative Court in Leipzig in May and September 2018. The Wannsee route will thus be available as planned at the opening of BER.

## Lawsuits Due to Decisions in Accordance with § 18a German Civil Aviation Act (Building-restricted Areas)

Lawsuits concerning the BAF's decisions on building-restricted areas decreased in the reporting period 2017/2018 compared to the previous period. Subjects of these lawsuits were in particular negative decisions of the BAF on planned wind power plants.

The hearings are still characterised by intensive debates of experts but new legal issues are also increasingly discussed. In terms of numbers, the regional focus of lawsuits is on the state of Lower Saxony with currently nine proceedings in which the BAF is involved.

After a ruling of the Federal Administrative Court in early 2016 which confirmed the decision of the BAF on which the lawsuit was based, many complaints were withdrawn thus reducing the number of ongoing proceedings in the reporting period. It was not until 2018 that there was a significant but moderate increase in summonses to new lawsuits.

In 2018, some of the longest ongoing proceedings were completed at first instance, namely four proceedings that were pending at the Administrative Court of Oldenburg. This court decided against the BAF and DFS at the parallel expedited proceedings in 2014.



The Federal Administrative Court in Leipzig generally confirmed a decision of the BAF also with regard to building-restricted areas

The ruling of 2018, however, was positive for the BAF and DFS after the Higher Administrative Court of Lüneburg did not agree to the Administrative Court with regard to the expedited proceedings: The Administrative Court of Oldenburg allowed the two complaints of the BAF and the two complaints of Deutsche Flugsicherung GmbH (DFS) against approvals for wind power plants in Ganderkesee-Lemwerder. The court's official press release states that "The decision made by the Federal Supervisory Authority for Air Navigation Services in accordance with § 18a of the German Civil Aviation Act is a binding final regulation. The Federal Supervisory Authority for Air Navigation Services is an expert authority with

pooled expertise.” Both the defendant district and the project developers filed an application for leave to appeal against the rulings.

The lawsuits in the reporting period were accompanied by some new expert reports which, however, did not provide new findings on the difficult issues of possible interference of omnidirectional radio beacons caused by wind power plants. The completion of the “WERAN” (Interaction between wind turbines and terrestrial navigation/ radar systems) project conducted by the Physikalisch-Technische Bundesanstalt was delayed again. Furthermore, a follow-on project was commissioned. The scientific issues have yet to be resolved. Another ruling was delivered by the Hessian Higher Administrative Court in October 2018 which also confirmed the decision of the BAF. The appeal against the ruling which would have to be decided upon by the Federal Administrative Court in Leipzig was not accepted.

## Facts and Figures

### Citizens’ Inquiries under the Environmental Information Act (UIG) and the Freedom of Information Act (IFG)

What is striking in the statistics of citizens’ inquiries under the UIG and IFG is that the number of inquiries on the future Berlin Brandenburg Airport (BER) and generally on the two airports in Berlin Tegel and Brandenburg Schönefeld is heading towards zero so that they are no longer listed in the table.

Table 3: Citizens’ Inquiries and Complaints in 2017/2018 (incl. Applications under the UIG and IFG))

Place	2017	2018	Change Compared to 2017 in %
Frankfurt	98	42	- 57 %
Hamburg	222	569	+ 347 %
Others	75	57	- 18 %
Total	395	668	+ 273 %

Source: BAF

The complaints on Hamburg increased again; the number also includes barely differing repetitive complaints. The reason for this is the issue of railway use rules and their application by air navigation service providers. The number of inquiries that do not concern Frankfurt and Hamburg also decreased. However, it became apparent that the inquiries addressed a special topic more specifically and in more detail, and there was lively correspondence in these cases.

### Rights of Passage for Restricted Areas (ED-R)

The number of approved or processed cases is still high and largely determined by applications for the use of unmanned aviation systems (drones or UAS) in the commercial area. Furthermore, inquiries on military flight-restricted areas are quite common because



these areas are partly very extensive and encompass towns, commercial zones and landscapes which are also entered due to commercial use (by UAS and aircraft).

Year	Number
2010	112
2011	113
2012	117
2013	236
2014	315
2015	346
2016	408
2017	470
2018	431
Total 2010-2018	2.548

Source: BAF

### Airspace Violations

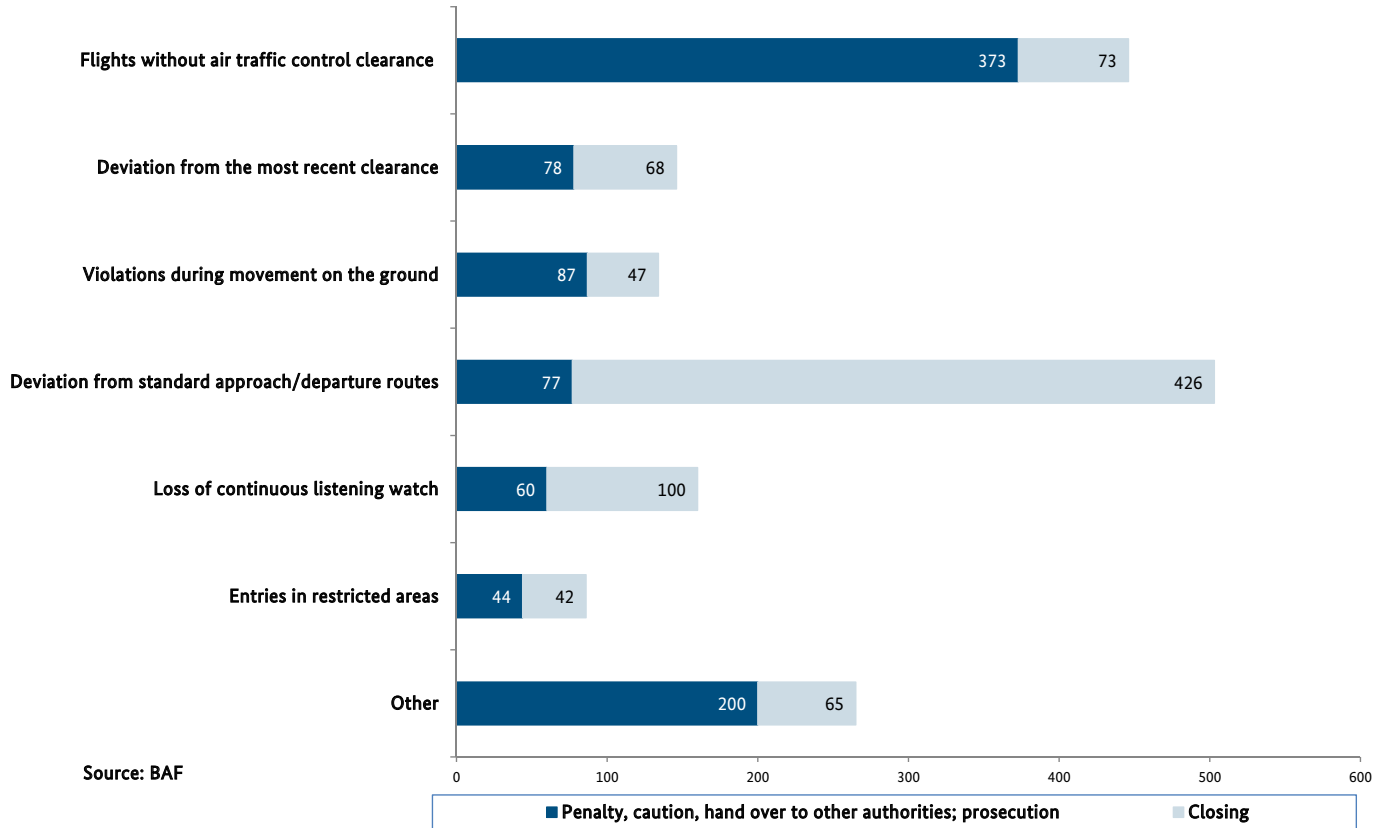
Airspace violations are prosecuted by the BAF. They are still an issue for general aviation. In 2017, they were the focus of the specialist press and were passionately discussed.

At the invitation of “aerokurier”, the BAF therefore participated in a panel discussion on “airspace violations and their consequences”

at the AERO air show in Friedrichshafen in 2017. Together with other experts from the industry, the Director of the BAF was invited to a panel discussion where the different perspectives for the causes and conditions of airspace violations were discussed both in the group and with the audience. It became apparent that the BAF prosecuted offences in air traffic prudently. Conversely, adequately prepared pilots cannot generate airspace violations in the first place.

The following diagram shows the offences in air traffic addressed by the BAF in 2017 and 2018, divided into different categories. The number of stayed proceedings is also shown.

**Regulatory offences prosecuted by the BAF in 2017/2018, by type of offence**



Source: BAF

# Civil-Military Cooperation

A distinctive characteristic of air traffic in Germany is the integrated civil-military management of airspace outside the areas of responsibility of military airfields by civil air navigation service providers. The supervisory authorities for air navigation services, the BAF and the Federal Office of the Bundeswehr for Military Aviation (LufABw), therefore assumed the obligation of close civil-military cooperation. The two authorities have been connected for almost 3 years by a joint framework agreement which, in 2017, was extended to include cooperation in aviation medicine. Both regular discussions at director level and numerous agreements at specialist level are standard practice. This cooperation is ensured by the Liaison Office for Military Air Navigation Services (VBB) located at the BAF which is staffed with LufABw employees.

## Airspace Integration of Unmanned Aircraft

Currently, each country is responsible in its own territory for the integration of remotely piloted aircraft systems (RPAS) into general air traffic in all airspace categories. There are – particularly in the judicial area of the European Union – recommendations but there are still no internationally applicable requirements on how unmanned aircraft shall be integrated into general airspace. Therefore, flight operations of military RPAS are almost exclusively conducted in segregated airspaces (flight restriction areas). The need for the development of internationally harmonised regulati-

ons has been recognised by the ICAO, the Federal Aviation Administration (FAA) of the USA, and the EASA. At present, every effort is being made to establish appropriate regulations and procedures. The aim of the EASA is to develop regulations for all classes of unmanned systems..



The reconnaissance drone HERON 1 shortly before taking off

According to the federal government's plans, the Bundeswehr shall be equipped with the high-altitude drone PEGASUS from 2025. The aim is to participate in general air traffic in a step-by-step approach which has to be agreed with the relevant authorities in Germany. The Federal Ministry of Defence has tasked the Federal Office of the Bundeswehr for Military Aviation (LufABw) with esta-

blishing a working group that will analyse the implementation of this planned airspace integration. Besides representatives of the Federal Ministry of Transport and Digital Infrastructure (BMVI) and the Federal Ministry of Defence, EUROCONTROL and DFS Deutsche Flugsicherung GmbH, the BAF was also continuously involved in the work.

The responsibility of the BAF mainly results from the change to the functional air navigation services system associated with airspace integration. This change must be evaluated by the civil air navigation service provider concerned using an appropriate methodology (safety assessment (SiBe)), and the request for changing the functional air navigation services system must be submitted to the approving authority (in Germany: the BAF). In German airspace, the requirements of the regulation on ATC equipment (FSAV) must also be met. Equipment deficits under the FSAV generate risks which have to be evaluated and approved by the relevant supervisory authorities (in Germany: the BAF). The BAF participated in the development of an appropriate concept paper for airspace integration of the PEGASUS system together with the joint liaison office.

## Talks of the LufABw and BAF Directors

Talks at director level are key elements in the cooperation of the two authorities. Major General Christian Badia, Director of the LufABw since September 2017, paid a visit to the Director of the BAF on 5 April 2018. This meeting was designed as a high-level meeting with a smaller group of people. On the one hand, this should allow the two directors to get to know each other better.

On the other hand, this type of implementation provided sufficient scope for discussing specialist topics through direct dialogue at director level. The main focus was on the sovereign task of armed forces in civil-military airspace and Bundeswehr requirements for unimpeded operational and training flights.

Particular challenges for airspace integration arise from the planned increasing deployment of military drones especially against the background of the PEGASUS project. Other topics considered were the European SES regulations and their requirements for the equipment of military aircraft as well as supplementary national provisions such as the FSAV. Furthermore, issues of bilateral cooperation could be discussed in a very cooperative and open atmosphere by giving specific examples such as the cooperation with the EASA or the current “MaRS” project. The “MaRS” project is a programme of DFS for the replacement of ANS infrastructure where the data of military sensors shall be used during the reconstruction phase.



From left to right: Lieutenant Colonel Klaus Weinberg (VBB), Prof. Dr. Nikolaus Herrmann (Director of the BAF), Major General Christian Badia (Director of the LufABw), Captain Florian Koschik (Military Assistant to the Major General)

In the meantime, Major General Christian Badia was appointed Director-General at the Federal Ministry of Defence. The first meeting between the Director of the BAF and the new director of the LufABw, Major General Günther Katz, took place in Cologne on 20 November 2018.

## Visit of the Military Executives to the BAF

The visit of the “air mission control service” course students to the BAF has meanwhile become a regular event. This training course is designed for future executives of military air navigation services and tactical control services and is held every two years. The aim of the course is the academic discussion of the key subject areas of air safety, civil-military cooperation in air navigation services and flight safety.

Twelve Bundeswehr members participated in the visit to the BAF on 18 July 2018. The main topics examined were the interfaces with the BAF and the differences compared to the military counterpart, the LufABw. Further subjects included the implementation of the numerous requirements of EU legislation, issues of the auditing and certification of air navigation service providers as well as the prosecution of offences in case of airspace violations under § 63 LuftVG where the BAF supervises not only civil pilots but also military pilots.

# Europe and the World

## Single European Sky (SES)

### Legislation

Busy European airspace with increasing traffic figures poses high demands on everyone involved. This is why the European Commission initiated a programme for a Single European Sky (SES) already in the late 1990s. The objectives of the programme are in particular uniform high safety standards in Europe, increase in efficiency, reduction of fragmentation, improved civil-military integration and increase in capacities for air traffic.

The European regulatory framework for air navigation services was continuously developed in the reporting period. The BAF intensively supported the legal projects and was actively involved in the implementation of the SES. Significant changes are brought about by Commission Implementing Regulation (EU) 2017/373 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight. This regulation supersedes Implementing Regulations No 1034/2011 and No 1035/2011 applicable to BAF safety oversight. Implementing Regulation (EU) 2017/373 will implement in particular various ICAO requirements in EU legislation thus contributing to the harmonisation of oversight in European member states by defining a uniform regulatory structure. In addition, Implementing Regulation (EU) 2017/373

stipulates the key oversight requirements in more detail and more specifically. Furthermore, it lays down requirements for human factors and the management systems of supervisory authorities. The BAF continuously adapts its activity to these new requirements which include both internal and technical requirements for ATM/ANS. In addition, the EU adopted Commission Implementing Regulation (EU) 2018/1048 laying down operating procedures concerning performance-based navigation (PBN). This regulation shall implement ICAO requirements and will lead to the extensive replacement of ground-based navigation procedures by satellite navigation over the next one and a half decades. The use of performance-based navigation allows flight procedures to be optimised thus achieving advantages in terms of safety, capacity and efficiency. To this end, harmonised airspace usage requirements and operating procedures concerning performance-based navigation were laid down. The regulation shall apply with effect from 3 December 2020. For this purpose, DFS is currently preparing an implementation plan which will be reviewed by the BAF and approved by the Federal Ministry of Defence.

## EASA-Regulation

With the new EASA Regulation (EU) 2018/1139, the previous regulation (EU) No 216/2008 has been extensively revised. It lays down common rules in the field of civil aviation and for establishing a European Union Aviation Safety Agency (EASA). The BAF gave its opinion and intensively participated in the consultation process.

The new EASA regulation contains numerous new provisions, for example on unmanned aircraft and their pilots, environmental protection, interoperability and cyber security. The competences of the EASA will be significantly enhanced in the field of air navigation services. Details will be provided by delegated legislative acts or implementing acts of the Commission. In accordance with Article 74 of the regulation, the EASA will, together with the European Commission and the competent national authorities, set up an information store which shall ensure effective cooperation between the agency and the competent authorities in the performance of their certification, supervision and implementation tasks.

## Cooperation with Neighbouring Countries

The regular exchange with supervisory ANS authorities of neighbouring countries is now standard practice in the implementation of the SES. With the concept of “Functional Airspace Blocks” (FAB), the EU member states organise their airspaces in blocks according to functional criteria irrespective of national borders. In January 2018, the National Supervisory Authorities Committee (NSAC) of the Functional Airspace Block Europe Central (FABEC) held a mee-

ting in Langen at the BAF. At the very beginning of the year, representatives of the relevant national authorities from Belgium, the Netherlands, Luxembourg, France and Switzerland came to Germany to agree on important issues and decisions. Furthermore, the Liaison Office of the Federal Office of the Bundeswehr for Military Aviation located within the BAF is represented by its director in the two committees NSAC and HAC. The main topic of the NSAC meeting was the concept on risk-based supervision at FABEC level. After a year of intensive preparation in the NSAC and its working groups, a process was defined which allows for possible supervisory activities to be identified and specified at FABEC level based on a joint risk analysis.



EASA's exhibition stand at the AERO air show is a crowd-puller, for example for issues concerning the EASA Regulation

In addition, trilateral meetings are held annually with the supervisory authorities from Austria and Switzerland. The aim of the meetings is regular information exchange on relevant changes in the structure of supervisory authorities and on cross-border processes and incident reports. The meetings have proven successful and promote the important and constructive cooperation with neighbouring countries. In November 2017, the trilateral meeting took place at the BAF in Langen with lively expert discussions. The BAF was able to share its good experience from the EASA inspection in the field of aviation medicine. Another item on the agenda was the current status of the agreements on the exchange of radar data. The certification of flight information services providers (AFIS) and the supervision of these providers were also intensively discussed. In June 2018, the BAF visited Vienna. Among other things, the impact of the new Implementing Regulation (EU) 2017/373 on the supervisory activity of authorities was discussed. In addition, the authorities exchanged information on their activities related to the implementation of the Single European Sky ATM Research Programme (SESAR).

While cooperation with Belgium, France, Luxembourg, the Netherlands and Switzerland takes place within the scope of the FABEC, cooperation and information exchange with the other neighbouring countries of Germany are based on bilateral agreements that the BAF concluded with the supervisory authorities of these countries. These cooperation agreements provide for regular meetings and consultations. On this basis, two representatives of the Danish

supervisory authority for air navigation services paid a working visit to the BAF in March 2017. The aim was to exchange EASA statements from the last inspections in Denmark and Germany and to revise the bilateral agreement. After several working meetings at the specialist level in Prague the previous year, representatives of the Czech supervisory authority visited the BAF in November 2018. A central topic of this meeting was the exchange of information on the adoption of Implementing Regulation (EU) 2017/373 also with regard to the potential adjustment of the bilateral agreement. In addition, there was an intensive exchange on the procedure for changing functional air navigation services systems with cross-border reference and on the training of German air navigation services personnel at a Czech training organisation. Issues from the field of ATC technology were also discussed.

These regular exchange visits take place in a trustful, open atmosphere and lead to an intensive exchange of information. They are now well established in the performance of supervisory tasks.

## Visits of International Delegations

In the 2017/2018 reporting period, the BAF received several foreign delegations from Europe, Asia and South America. The guests appreciated the high level of competence and experience of the BAF. During these visits, the guests were able to inform themselves extensively about the air navigation services system and civil-military cooperation in Germany at the BAF and DFS. They gained some helpful insights into the performance of tasks by the BAF.





The departments present the different task areas of the BAF to the delegation from Georgia

A four-person delegation of the Georgian civil aviation authority visited the BAF in March 2017 in the context of a so-called “twinning” project. “Twinning” is a transnational partnership project on behalf of the European Commission. Many specialist topics were on the agenda, such as flexible airspace usage, which was lively discussed. Furthermore, there were presentations and an intensive exchange of information on frequency management and flight calibration at the BAF. Organisational and administrative processes were also discussed. The guests were given comprehensive information and many new ideas.

A delegation from Japan came to Langen in February 2018 to obtain information on the air navigation services system and civil-military cooperation in Germany.

The “EU-Brazil Sector Dialogues” shall strengthen the strategic partnership between the EU and Brazil. In this connection, two representatives of the Brazilian ministry of transport paid a three-day visit to the BAF and DFS in Langen in September 2018. During this visit, the principle of the SES was explained, the specialist departments of the BAF introduced themselves and answered the numerous questions from the guests. Also in September 2018, the BAF received a Ukrainian delegation. The visit was a good opportunity to get to know each other and exchange information on the relevant regulation approaches. The guests obtained insights and useful information on the definition of flight procedures and the relevant safety oversight. After the visit, the participants drew a positive conclusion from the mutual exchange. The visiting delegation emphasised that the contents presented would help them to better understand the EU requirements.

## International Civil Aviation Organisation (ICAO)

### 13th ICAO Air Navigation Conference

The International Civil Aviation Organisation (ICAO) is a special organisation of the United Nations with 193 member states, which has its headquarters in Montréal/Canada. The 13th Air Navigation Conference, attended by the Director of the BAF, took place in Montréal from 9 to 19 September 2018.



Participants of the 13th Air Navigation Conference in the great hall at the ICAO's headquarters in Montréal

The Air Navigation Conference is held every six to ten years and serves the purpose of discussing the future of air navigation services and providing recommendations to the ICAO and member sta-

tes. Such a conference cannot make binding decisions, this is reserved for ICAO bodies, in particular the general assembly which is held every three years. The 13th Air Navigation Conference, which was attended by 1,213 delegates from 116 ICAO member states and 37 international organisations, also served as a preparation for the general assembly of 2019. Subjects of the conference were the future of air navigation services and aviation safety. One focal point of the consultations in the field of air navigation services was the further development of the worldwide "Global Air Navigation Plan" (GANP). With a 15-year horizon, the GANP describes a strategic development programme which is intended to assist the ICAO, the member states and industry in modernising air navigation services continuously and in a coordinated manner. Topics such as satellite navigation, comprehensive system-wide information management and the future of unmanned aviation played a central role. At this conference, Europe spoke with one voice: all European countries working together in the European Civil Aviation Conference (ECAC, where all European countries except Belarus and Russia are represented) prepared the conference together and cooperated closely during the conference.

# Outlook for the Future

## Remote Tower Control Project

Since early 2014, the BAF has been supporting the Remote Tower Control (RTC) project of DFS. The aim of the project is to control the airports of Saarbrücken, Erfurt and Dresden from one single location, the Remote Tower Control Centre at Leipzig Airport. For Saarbrücken Airport, commissioning took place on 4 December 2018 when DFS placed a camera tower near the old control tower. At the Remote Tower Control Centre, air traffic controllers receive a permanent 360-degree view of the airport from video and infrared cameras. For safety reasons, the system is designed redundantly. The aircraft taking off and landing can either be tracked automatically or manually using the pan-tilt-zoom cameras. Furthermore, the system detects movements and highlights vehicles and aircraft on the ground and in the air on the monitors for air traffic controllers.

Such a system places new requirements on operating procedures, personnel and technology. In the technology introduction process or shortly before the commissioning of a system by the air navigation service provider, an EC evaluation is conducted and submitted to the BAF in an EC declaration of verification (EGP). Deficiencies in the EC declaration of verification may delay or even prevent commissioning of the system which should be avoided. Therefore, regular status meetings have been held with DFS since 2014. In-

spectations, as in 2017 on the Site Acceptance Test at the Remote Tower Control Centre, supplement project support.



View onto the RTC (Remote Tower Control) camera tower of DFS in Saarbrücken

## World Radio Conference 2019

### Protection of the Spectrum

Undisturbed emission and reception of radio waves is indispensable for smooth flight operations. This is ensured at the BAF, for instance, through preventive interference analyses among frequen-

cies (frequency management) and the effect of planned structures (ANS facility protection) on signals.

It furthermore includes protection in the way that new ATC technology must be integrated into the frequency spectrum to be protected and the existing spectrum of aviation applications must be protected against the integration of other potentially damaging radio services. Considerations on protective measures are also discussed by the participating states at a World Radio Conference (WRC).

Under the umbrella of the International Telecommunication Union (ITU), the WRC, which is held every four years on average, divides the entire frequency spectrum among the users. The resulting frequency assignments and further provisions are recorded in “radio regulations”, which are binding for the member state like ICAO requirements.

### Preparation of the WRC 2019

Such a WRC also took place in the autumn of 2019 so that the years 2017 and 2018 formed the hot phase of preparation of this conference. As an expert for aviation applications, the BAF is part of this frequency policy and, besides the Federal Network Agency, represents the interests of German air navigation service providers in national and international working groups. On the one hand, the BAF ensured the adequate consideration of aviation matters in the German position on the WRC by participating in the national preparation team for the WRC and its associated working group 2. On

the other hand, national interests were also integrated into the aviation-specific positions of these organisations on the WRC by participating in the Aeronautical Spectrum Frequency Consultation Group (ASFCG) at EUROCONTROL and in the Frequency and Spectrum Management Panel (FSMP) of the ICAO.

Outside the WRC cycle designated for spectrum planning, European aviation had to fight in 2017 and 2018 with other attempts to share the scarce resource of frequency spectrum with non-aviation services. For instance, the United Kingdom intends to share the 960 – 1164 MHz frequency band, which is exclusively assigned to aviation, with Programme Making and Special Events (PMSE) applications – wireless microphone technology. Such an opening of an exclusively and heavily used aviation band entails risks which must be considered in European and national decision processes. This has been and will be ensured by the BAF in the best possible way through cooperation in technical and regulatory working groups of the European Conference of Postal and Telecommunications Administrations (CEPT).

# Inside the BAF

## Quality Management

As a constitutional administrative authority, the BAF is bound by the rule of law. The relevant German and European legal provisions contain numerous requirements for the quality of administrative measures. German authorities such as the Federal Court of Auditors and the Federal Commissioner for Data Protection and Freedom of Information as well as European and international agencies such as the EASA and ICAO regularly review compliance with those quality requirements.

### Audits of the EASA at the BAF

The European Aviation Safety Agency (EASA) conducts regular inspections to check whether the competent national authorities adopt Regulation (EC) No 216/2008, superseded by Regulation (EU) 2018/1139 since 2018, and its implementing provisions, and reports on it to the European Commission.

In February 2017, the EASA conducted a comprehensive standardisation inspection at the BAF. Subjects of the inspection were the licensing or certification of air traffic controllers and training organisations as well as supervision of air navigation service providers. In addition, the EASA reviewed the management system of the BAF based on the requirements of Commission Regulation (EU) 2015/340 applicable since 1 January 2017.



EASA's inspection team with the Director of the BAF

In September 2017, the EASA conducted another inspection on the standardisation in aviation medicine at the BAF in accordance with Commission Regulation (EU) 2015/340. This regulation governs the requirements for the authorities responsible for aviation medicine relating to air traffic controllers, the certification of aeromedical centres and aeromedical examiners as well as the requirements for medical fitness examinations of air traffic controllers. Commission Regulation (EU) 2015/340 superseded Commission Regulation (EU) No 805/2011 previously in effect for aviation medicine. Furthermore, the provisions of the Regulation on ANS Personnel and their Training (FSPersAV) relating to air traffic controllers are no lon-

ger applicable. For this reason, the BAF developed a new supervision concept. Besides the BAF, the EASA visited, on a random basis, an aeromedical centre (AeMC) and an aeromedical examiner (AME) that are under the supervision of the BAF.

### **Audits of the ICAO at the BAF**

The ICAO has a Universal Safety Oversight Audit Programme (USOAP) for civil aviation. From 19 to 30 June 2017, the ICAO conducted an audit in Germany in this context. The focal point of the audit fell within the area of responsibility of the Federal Aviation Office (LBA). The ICAO's auditor responsible for aviation personnel paid a one-day visit to the BAF to review the BAF's supervision over air traffic controllers. Representatives of the specialist department Safety Oversight over Air Navigation Service Providers and Personnel and the International Affairs staff unit were on hand to answer the auditor's questions. At the end of the audit, only a few non-conformities concerned the BAF. Subjects of the audit were the following fields:

- Legislation relating to aviation,
- Organisation of civil aviation including the authority structure,
- Licensing and training of aviation personnel, as well as
- Operation and maintenance of aircraft.

### **Visit by the Federal Court of Auditors**

In March 2017, the Federal Court of Auditors reviewed the BAF's corruption prevention measures. The report of the Federal Court of Auditors contains no audit findings, only individual recommendations and suggestions.

### **Federal Commissioner for the Data Protection and Freedom of Information**

The Federal Commissioner for Data Protection and Freedom of Information (BfDI) paid a "data protection-related information, consultancy and inspection visit" to the BAF in August 2018. The subject of the visit was particularly the implementation of the new requirements of the European General Data Protection Regulation which is to be applied from 25 May 2018. The BfDI's report on this visit contains a number of recommendations which will be gradually implemented.

## **Personnel**

### **Personnel Augmentation**

In the past two years, the BAF had a welcome increase in personnel and is thus another step closer to the goal of performing tasks with full personnel strength. By 31 December 2018, the number of personnel had increased to 93 (45 women, 48 men).



BAF auditors inspect an air navigation system

Because of their sovereign nature, the BAF's tasks are performed mainly by civil servants. Due to the established posts and positions allocated to the fiscal years of 2017 and 2018 as well as some vacancies, the focus of personnel work continued to be on personnel recruitment procedures. In the past two years, 30 job advertisements were published. 9 external staff were recruited, and 11 BAF employees successfully applied internally as part of their personal development.

## Occupational Health Management

In 2017, a back strengthening course was offered for the first time at the BAF in the context of occupational health management. The employees could take part in a one-hour in-house course once a week over 10 weeks. In this course, participants learnt exercises which they can also do outside the course, for example at their workplace, and learnt how to reduce or avoid muscle tension and stress.

Furthermore, BAF staff had the opportunity to be vaccinated against influenza. Many employees also took up the offer of preventive medical examinations.

A check of the auditing activity was conducted in the field of occupational safety and health. With 28 auditors (as of: 31 December 2018) at the BAF, this is one of the task areas where particular attention should be paid to occupational safety and health. During audits outside the BAF, employees are particularly exposed to risks. For this reason, personal protective equipment has already been partially exchanged or supplemented. In parallel, current operating instructions were updated or newly defined.

The essential information on occupational safety and health, fire protection as well as first aid are available to all staff on the BAF intranet. Regular training courses on these topics are conducted online.



## Official Agreement on Telework

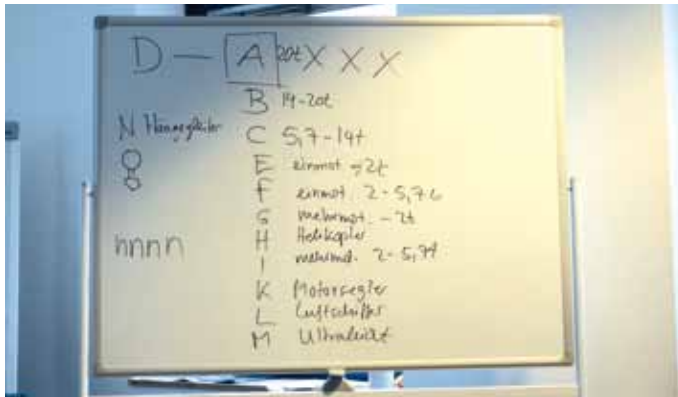
All BAF employees have the possibility to work up to two days per week from home – as long as this does not interfere with operational requirements. The authority's management and staff council signed a corresponding agreement on 27 July 2017.

## Advanced and Follow on Training

In the complex and highly specialised world of air navigation services, advanced and follow-on training for employees is of particular importance. The expertise of specialists must be constantly improved and updated.

For work to be successful, it is also important that the specialist knowledge gained can be made available to all staff. The BAF's advanced and follow-on training programme allows employees on the one hand to take part in numerous events organised by external providers.

On the other hand, internal follow-on training is a central component of operational knowledge management. In-house know-how and the commitment of a number of staff again made it possible in 2018 to offer an internal series of seminars with air navigation service-specific basic courses. The topics addressed ranged from fundamentals of aviation organisation and regulations as well as fundamentals of ATC technology to follow-up courses in the field of communication, navigation and surveillance (CNS). In addition, it was possible to take part in the two thematic blocks of air navigation services and ATS infrastructure. Thus, the employees had the opportunity to acquire or deepen their knowledge successively.



Basic knowledge is acquired in internal advanced and follow-on training courses – in the photo: the different aircraft classes and their designation



# Press and Public Relations

## Relaunch of the BAF Website

In the spring of 2017, the BAF website was substantially revised and put on a new technical basis. The BAF's new website offers users numerous improvements: a user-friendly design with improved menu navigation, a better overview, and quick and convenient expert search, to name but a few..



The BAF's new website went online after the substantial relaunch for the AERO in April 2017

Technically, a lot has happened since the BAF website went live in 2012. The new platform of the Government Site Builder (GSB) en-

ures the accessibility of the website. The information provided on the internet is accessible to everyone, regardless of personal prerequisites and capabilities as well as the hardware and software used including the display on different mobile terminals.

## Exhibitions and Events

The „AERO“ Global Show for General Aviation in Friedrichshafen (Lake Constance) celebrated its 25th anniversary in 2017. It was the sixth time for the BAF and the other federal aviation authorities to take part in this trade show.

The BAF conducted special press and public relations activities for the anniversary AERO. The specialist press was invited to a press conference. The interlocutor for the journalists was the director of the BAF, Prof. Dr. Nikolaus Herrmann. The focus was on “wind power and air navigation services” as well as “flight procedures” and “airspace violations”.

At the AERO 2018, the changeover of air-ground voice channel spacing from 25 kHz to 8.33 kHz was the dominant topic. Besides discussions at the exhibition stand, the BAF invited visitors to two special presentations on the first and second days of the show. The speaker was Dominik Meyer, Head of the Frequency Management and ANS Facility Protection Unit. The aim was, among others, to raise the awareness of deadlines set by the EU for applications.



of the air traffic system. The visit to the BAF offers future managers an insight into the organisation and activities of the supervisory authority and facilitates the establishment of personal contacts.

Dominik Meyer (Head of the Frequency Management Unit) at his presentation on the changeover of VHF air-ground voice channel spacing from 25 kHz to 8.33 kHz

The positive response at the trade fairs in the past two years shows that trade fair representation offers a good opportunity to meet industry experts and the interested public and to enter into dialogue with general aviation..

## DFS Technology Trainees

Since 2014, a one-day visit to the BAF has been an integral part of the DFS Technology Trainees Programme, a two-year programme for the promotion of junior managers at DFS Deutsche Flugsicherung GmbH. The aim is to give trainees a comprehensive overview

# Abbreviations

<b>A</b>		<b>C</b>	
AeMC	Aero Medical Centre	CEPT	European Conference of Postal and Telecommunications Administrations
AFIS	Aeronautical Flight Information Service	CNS	Communication, Navigation, Surveillance
AIP	Aeronautical Information Publication	COC	Certificate of Competence
AIS	Aeronautical Information Service	<b>D</b>	
AMC	Acceptable Means of Compliance	DAS	DFS Aviation Service
AME	Aeromedical Examiner	DFS	Deutsche Flugsicherung GmbH
ASM	Airspace Management	DIN	German Institute for Standardisation
ATC	Air Traffic Control	DVO	Implementing Regulation
ATFM	Air Traffic Flow Management	DVOR	Doppler Very High Frequency Omnidirectional Radio Range
ATM	Air Traffic Management	<b>E</b>	
ATS	Air Traffic Services	EASA	European Aviation Safety Agency
<b>B</b>		EC	European Community
BAF	Federal Supervisory Authority for Air Navigation Services	ECAC	European Civil Aviation Conference
BfDI	Federal Commissioner for Data Protection and Freedom of Information	ECCAIRS	European Coordination Centre for Accident and Incident Reporting Systems
BMVg	Federal Ministry of Defence	EG	European Community
BMVI	Federal Ministry of Transport and Digital Infrastructure	EGNOS	European Geostationary Navigation Overlay Service
BNetzA	Federal Network Agency for Electricity, Gas Telecommunications, Post and Railway	EGP	EC declaration of verification
BRH	Federal Court of Auditors	EU	European Union
BVerwG	Federal Administrative Court		

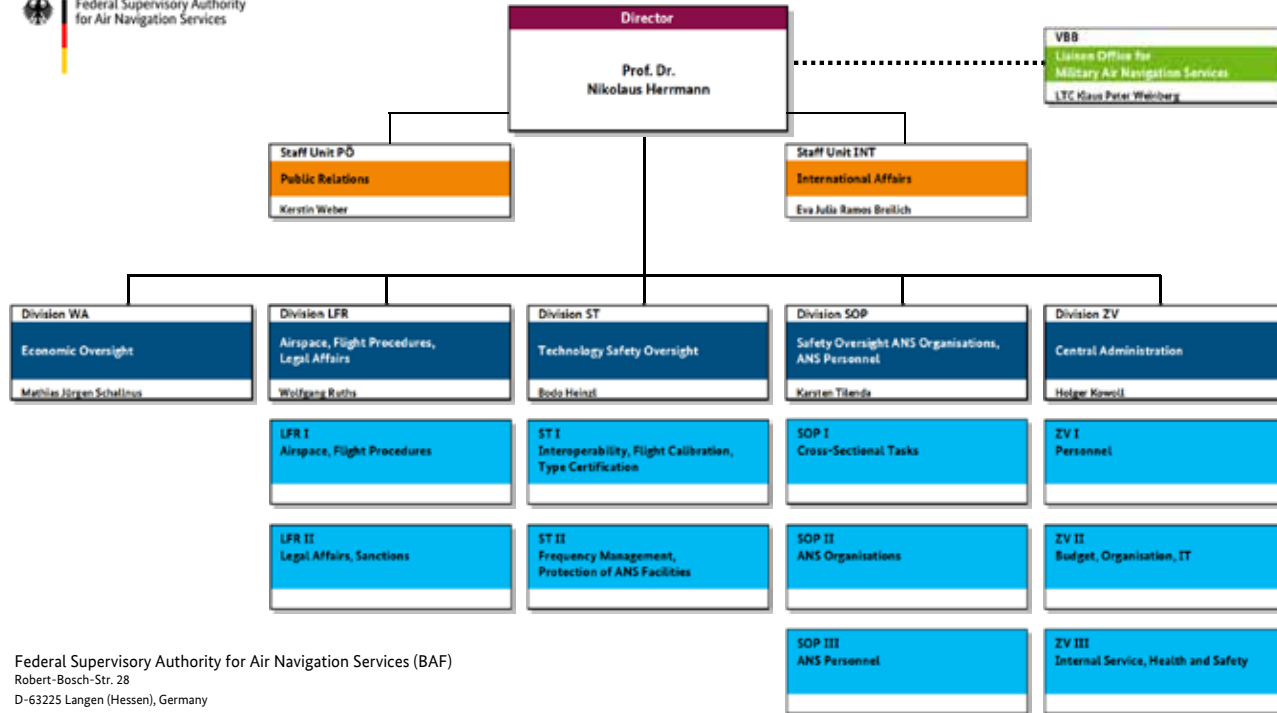
EUROCONTROL	European Organization for the Safety of Air Navigation	H HAC	Harmonisation and Advisory Committee
F		I	
FAA	Federal Aviation Administration	ICAO	International Civil Aviation Organization
FAB	Functional Airspace Block	IFG	Freedom of Information Act
FABEC	Functional Airspace Block Europe Central	ILS	Instrument Landing System
FAQ	Frequently Asked Questions	ITU	International Telecommunication Union
FS	Air Navigation Services (ANS)	K	
FSAV	Regulation on Air Traffic Control (ATC) Equipment of Aircraft	kHz	Kilohertz
FSMusterZulV	Regulation on Type Certification for Air Navigation Equipement	L	
FSPersAV	Regulation on ANS Personnel and their training	LAB	Language Assessment Body
FSSStörSchutzV	Regulation on the Prevention of Interference with ANS Facilities by Radio Installations	LBA	Federal Aviation Office
		LFZ	Aircraft
		LiMa	Licence management data base at the BAF
		LufABw	Federal Office of the Bundeswehr for Military Aviation
G		LuftVG	German Aviation Act
GALILEO	European global satellite navigation system	LuftVO	German Aviation Regulation
GANP	Global Air Navigation Plan	M	
GBAS	Ground Based Augmentation System	MED	Medical
GIS	Geographic Information System	MET	Meteorology
GM	Guidance Material	MG	Major General
GSB	Government Site Builder		
GPS	Global Positioning System		

N		SESAR	Single European Sky ATM Research
NAV	Navigation	sFSB	other ANS Personnel
NfL	Aeronautical Information Bulletin	SiBe	Safety assessment
NSAC	National Supervisory Authorities Committee	SSC	Single Sky Committee
O		T	
Occurrence	Reportable incident in air traffic	TO	Trainingsorganisation
OTL	Lieutenant colonel	TWR	Tower
OVG	Higher Administrative Court	U	
P		UAS	Unmanned Aircraft Systems
PBN	Performance Based Navigation	UIG	German Environmental Information Act
PEGASUS	Persistent German Airborne Surveillance System	USOAP	Universal Safety Oversight Audit Program
PRB	Performance Review Body	V	
PTB	Physikalisch-Technische Bundesanstalt (national metrology institute)	VBB	Liaison Office for Military Air Navigation Services
R		VGH	Higher Administrative Court
RPAS	Remotely Piloted Aircraft Systems	VHF	Very High Frequency
RTC	Remote Tower Control	VO	Regulation
S		VOR	Very High Frequency Omnidirectional Radio Range
SBAS	Satellite Based Augmentation System	W	
SDA	System Design Approval	WAAS	Wide Area Augmentation System
SES	Single European Sky	WRC	World Radio Conference

# Organisational Chart



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