2015 at a glance

Air traffic in German airspace

- Size of German airspace: 390,000 square kilometres
- IFR flights: 3.03 million (+1.5%)
- IFR take-offs and landings: 2.14 million (+1.2%)
- Peak day: 10,065 IFR flights

Safety

Infringements of separation (en-route)
Per 1 m flight hours (RAT ABC)
- TARGET: 35
- 2014: 24.7
- 2015: 12.7

Infringements of separation (terminal)
Also includes runway incursions per 100,000 aircraft movements (RAT ABC)
- TARGET: 1.37
- 2014: 0.32
- 2015: 0.59

Punctuality

ATFM en-route delay
Average delay per flight
- TARGET: 0.27
- 2014: 0.13
- 2015: 0.12

ATFM arrival delay
Average delay per flight
- TARGET: 1.60%
- 2014: 1.23%
- 2015: 1.17%

Environment

Horizontal flight efficiency
Deviation from the direct route
- TARGET: 0.09
- 2014: 0.001
- 2015: 0.008

Safe, efficient and even more punctual

For the first time since 2011, the number of aircraft movements in German airspace exceeded the three million mark. In 2015, DFS air traffic controllers handled a total of 3,029,066 flights, which corresponds to a 1.6 percent increase over the previous year. As regards indicators of safety and en-route flight efficiency, DFS was able to maintain the very high levels of the previous years. Punctuality indicators even experienced an increase.
Decade of stagnation

The air transport market in Europe is recovering slowly. In 2015, the 28 EU Member States registered 8.93 million controlled flights, a rise of 1.6 percent over the previous year.

If the whole European airspace is examined, the number of flights rose to 9.75 million (+1.5 percent). This is still, however, below the record levels recorded back in 2008. Even with the relief for the airlines’ finances provided by lower fuel prices, the European Organisation for the Safety of Air Navigation (EUROCONTROL) still forecasts only moderate growth for the near future. EUROCONTROL assumes average annual growth of between 0.7 and 3.8 percent until 2022 in its medium-term forecast presented in February. According to this forecast, the record peak of 10.2 million controlled flights will not be reached again until 2017 – a decade later.

Germany has experienced a similar scenario. The number of controlled flights in German airspace in 2015 exceeded three million (3,029,066) for the first time since 2011. This is a 1.6 percent rise over the previous year. Nevertheless, the record high of 3.15 million controlled flights last seen in 2008 will be reached in 2016 at the earliest according to the EUROCONTROL forecast. It could be even later if things turn out badly. EUROCONTROL anticipates average annual growth of between 0.7 percent and 3.4 percent for Germany. It can be seen that growth in Germany will be as moderate as in the rest of Europe.

Traffic growth in German airspace is primarily attributable to the rise in overflights, whose share rose to 37.5 percent. The number of take-offs and landings at the 16 designated international airports rose by only 1.2 percent. The largest absolute growth was recorded at Berlin Schönefeld Airport, with traffic advancing by 11.3 percent, while take-offs and landings at Berlin Tegel Airport, which is operating at the limits of its capacity, remained almost unchanged with a plus of 1.2 percent. The opening of a new base by the Irish low-cost carrier Ryanair in October was the main reason for the growth at Schönefeld.
Caught between stagnation and growth

The market for air transport across the countries of Europe showed a lot of variability. Some countries experienced moderate growth, while others, Turkey for example, recorded growth in traffic of almost seven percent.

Germany’s traffic growth was average, making it by no means unique in Europe. France, which has the second largest volume of traffic in Europe after Germany, also experienced moderate growth (+1.5 percent). Italy, which comes in at fourth place, experienced a growth rate of only 1.0 percent. In the United Kingdom, third place in Europe, the number of flights increased by 2.4 percent in 2015. The above-average growth experienced in Spain, fifth place, continued in 2015, rising by 3.3 percent over the previous year.

Growth in air transport remained strong in Turkey, which is placed sixth in Europe. Turkey had experienced double-digit growth in the previous years and 2015 was no exception. In fact, the growth recorded was above average. There were 6.8 percent more controlled flights registered than in the previous year. Turkey has risen in popularity as a tourist destination. As a consequence, airlines in Turkey are growing strongly and are expanding their route networks. Turkish Airlines is a front runner in this development, but not alone; other airlines, such as Pegasus and Sun Express, a joint venture between Turkish Airlines and Lufthansa, are also expanding.

Turkey is the fifth most popular destination after Spain (the reigning champion), the United Kingdom, Italy and France for passengers flying from German airports. The number of flights to Turkey grew by 9.2 percent in 2015. Turkey is also a popular tourist destination for people flying from the Russian Federation, a group which makes up the second largest share of tourists after tourists from Germany. It remains to be seen what effect the recent terrorist attacks in Turkey and the tensions between Russia and Turkey will have on demand. At least in the first quarter of 2016, no negative impact was seen. The number of flight movements in Turkish airspace in the first three months came in above the level of the previous year.

The growth in traffic volume in Turkey can also be attributed to another reason as the number of overflights also rose, not just the number of take-offs and landings. Airlines are avoiding flying over Ukraine because of the armed conflict in eastern Ukraine and are increasingly flying over Turkish airspace on their way to Asia.

The neighbouring countries of Macedonia, Bulgaria, Romania, Hungary, Bosnia-Herzegovina and Greece have also recorded a considerable rise in overflights. The small neighbouring country of Moldova, on the other hand, is suffering from a decline in traffic, just as is Ukraine. The number of overflights in Ukraine sank by over 70 percent in the last months.

Passenger numbers at record levels

While the number of flight movements in European airspace grew only moderately, this was not the case for the number of passengers, which grew considerably. In 2015, 3.5 billion passengers were registered worldwide, representing a new record.

A new record high in passenger numbers was seen in Germany: According to the Federal Statistical Office, 194.7 million passengers used German airports in 2015, a rise of 3.9 percent. There were two factors why the growth in passenger numbers in Germany was so strong, coming in at twice the rise in flight movements: Airlines are cancelling routes where the load factor is not satisfactory and attempting to use larger, more economical, aircraft rather than smaller aircraft.

The airlines are also working intensively on getting the load factor of these larger aircraft as high as possible. The load factor has risen significantly in the past few years. Back in 1995, a third of all seats remained empty. Nowadays, over three quarters of the seats are taken. In 2015, the load factor was 76.7 percent in Germany, a new record.

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In 2015, the number of passenger kilometres flown in European airspace was 5.1 percent above the previous year’s value. According to the International Air Transport Association (IATA), passenger numbers increased worldwide, not just in Europe, rising by an average of 6.5 percent in 2015. Growth rates were particularly high in the Middle East (+10 percent) and in the Asia-Pacific region (+8.6 percent). According to IATA, 3.5 billion passengers were in the air in 2015; a record high.

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Safety: a year of contrasts

Any passengers boarding an aircraft can do so in good conscience. Air transport continues to boast a consistently high safety level.

According to IATA, the global accident rate per million flights was 0.32 in 2015. This means that there was one accident for every 3.1 million flights where an aircraft was damaged so badly that the hull was lost. By comparison, for road traffic, the rate is much worse. In Germany alone, for example, there were more than 300,000 accidents where people were injured. This resulted in 60,000 people who were seriously injured and 3,000 who lost their lives.

Due to the way the statistics are gathered, two events that hit the headlines last year are not included in the IATA numbers quoted so far. Both the Germanwings flight 9525 crash in the French Alps in March 2015 and the crash of the Russian charter flight 9268 departing from Sharm el-Sheikh are not considered to be accidents in the real sense of the word by IATA. The first tragedy was the result of deliberate action on the part of the co-pilot and the second tragedy was presumably caused by terrorists. IATA termed 2015 “the year of contrasts”. On the one hand, more than 500 passengers lost their lives to an act of suicide and terrorism. On the other hand, 2015 was the second safest year in IATA history based on the accident numbers.

Weak air freight market

The growth in air freight is considered a leading indicator of the strength of the global economy. Unfortunately, the freight market is growing only slowly.

The growth in air freight was significantly weaker than the growth in passenger numbers. Only 0.4 percent more air freight was handled at German airports than the year before, reaching a total of 4.5 million tonnes in 2015 according to official statistics. This picture was reflected worldwide. Only an average of 2.2 percent more freight tonne kilometres was registered by IATA in 2015 compared with the previous year.

Growth was particularly weak in North America, one of the prime markets for freight. Growth in freight tonne kilometres in North America was only 0.1 percent. Europe saw a decline of 0.1 percent. The Asia-Pacific region experienced a rise of 2.3 percent. This market is the largest, accounting for two fifths of the global market for freight. Just as with the passenger numbers, growth in freight in the Middle East recorded the highest rates (+11.3 percent).
The task of air navigation services is to ensure sufficient distance between aircraft, both in the air and on the ground. Any infringement of the prescribed minimum distances (known as separation minima) at DFS are recorded and analysed exactly. The separation minima are intentionally set high. In the air, the vertical distance is at least 1,000 feet (300 m) and the horizontal distance is three to five nautical miles (5.6 to 9.3 km). Minor infringements of these separation minima are also registered, even if more careful examination shows that the safety of the aircraft was not put at risk at any time.

DFS Safety Management analyses and assesses every event and then assigns it to a category based on its severity. This determines the level of air navigation services involvement in infringements of separation in which DFS played a role. DFS uses a new uniform classification system mandated by the European Commission to determine the relevant category. This new system replaced the one previously in use at DFS. The new Risk Analysis Tool (RAT) has been mandatory for all European air navigation service providers since 2015. This uniform tool enables the harmonisation of safety classifications and facilitates the comparison of the safety level of the individual countries with each other.

In 2015, 183 infringements of separation were registered in German airspace, 149 of which were caused by the involvement of air navigation services. The majority of these (122 cases), however, had no impact on safety. Only 24 cases were classified as significant, while three were considered as major. There were no serious safety risks in any of these cases.

Safety is everyone’s business

German airspace continues to boast a consistently high safety level. All those involved in aviation play their part: airlines, airports and air navigation service providers.

The tool distinguishes between four levels of severity: serious, major, significant and no safety effect. A fifth classification (not determined) is used where insufficient information is available to carry out a classification. This category is irrelevant for DFS as every infringement is documented by our systems so that a classification can be made. In the classification system previously in place at DFS, three categories were used. This makes it difficult to directly compare the data from the new analysis tool with the data from the past.

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Safety in the air and on the ground

It is not only in the air where DFS ensures safety. DFS tower controllers also coordinate the take-offs, landings and some of the ground traffic at airports. 

There are mandatory rules for separation minima on the ground just as there are in the air. These rules help prevent runway incursions, for example. A runway incursion is officially defined as any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing or take-off of aircraft. It does not matter whether other traffic was endangered or not. DFS records and investigates each and every runway incursion.

Since 2015, the new uniform Risk Analysis Tool (RAT) has been in use across Europe. Of the 111 runway incursions registered, only four were safety-related. One occurrence was classified as serious, two as major and one as significant. The behaviour of the cockpit crew played a role in three out of four cases. Air navigation services played a role in only nine percent of all cases.

Three out of four

This was the fraction of runway incursions that were attributed to the involvement of the cockpit crew.

On time nearly every time

The performance of DFS as regards punctuality was impressive. In 2015, 98.2 percent of all flights reached their destination without any delays caused by air traffic control – this is a new record.

Only 1.8 percent of all flights in 2015 were affected by air traffic flow management (ATFM) measures, caused by bad weather, capacity bottlenecks at airports or heavy traffic for example. This is reflected in the absolute figures. The average ATFM delay in German airspace in 2015 declined to 19.2 seconds.

The good performance of DFS does not mean that there will be no more delays in air transport. This is underlined by the Central Office for Delay Analysis (CODA), a department within EUROCONTROL that measures delays and analyses them using the reports of pilots. At the moment, two thirds of flights in Europe reach their destination on time or ahead of schedule. Nevertheless, a third of flights have a delay on arrival of at least five minutes.

The main reason for such delays are the knock-on effects of prior delays cascading through the day to impact later flights as well. These delays are often caused by the wait for connecting passengers, baggage or new crew. Looking at the average figures for Europe, two thirds of all delays can be attributed to the airlines. Only ten percent of all delays were caused by air navigation service providers. For Germany, this figure is even lower – only six percent.

Two thirds

This was the fraction of all delays caused by airlines.
As the crow flies

Direct routes save time, fuel and help the environment. DFS is already close to achieving the optimum flight path.

The air traffic controllers of DFS guide the aircraft under their control to their destinations safely, punctually and, as much as possible, as the crow flies, selecting the most direct route possible. This has been demonstrated by an analysis of en route flight efficiency, which looked at the actual route flown in comparison to the shortest possible one. In 2015, the flown route was, on average, only 3.7 km longer than the direct route, which corresponds to a deviation of only 1.2 percent. This is a value that would be hard to better for Germany, as it has one of the busiest and most complex airspaces in the world.

3.7 KILOMETRES
This was the difference between the shortest route and the route actually flown.
In 2015, air traffic controllers handled 3,029,066 flights under instrument flight rules in German airspace, a rise of 1.6 percent over the previous year. The number of controlled flights has been hovering around the three-million mark for a decade. The record high of the year 2008 was not reached.

More than 291,000 flights were controlled in the busiest month of July. The traffic volume was high in September, too. Although the summer school holidays had already ended everywhere in Germany, 10,065 flights were recorded in German airspace on 18 September – more than on any other day.
In 2015, military flights made up 1.5 percent of overall traffic volume. In nominal terms, there were 45,668 flights, a decrease of 3.9 percent over the previous year. 2013 was the only year with even less military traffic in German airspace.

For years, traffic figures in German airspace have been displaying two contrasting trends. While domestic traffic has been decreasing, the number of overflights has been rising. Since the beginning of this century, the share of domestic flights has decreased from 18.3 to 10.8 percent. At the same time, the share of overflights rose from 33.7 to 37.5 percent.

Four out of five aircraft taking off from international airports in Germany head for one of the countries listed above. Every tenth flight heads for the Spanish mainland, the Canary Islands or the Balearic Islands. Traffic heading for the Russian Federation is declining.

The Federal Statistical Office recorded 284,515 take-offs and landings of domestic flights. 88.6 percent of them took place at the 16 international airports. The airports of Munich (44,902) and Berlin Tegel (34,566) handled the majority of domestic flights.
The decline in domestic flights that has been observed over several years is especially noticeable at the international airports. In 2015, 1.97 million take-offs and landings were recorded. Although this is an increase of 1.2 percent over the previous year, it is still 3 percent lower than the value seen ten years ago. This table is based on all take-offs and landings under instrument flight rules (IFR).

Connections within Germany are counted as two aircraft movements – one arrival and one departure.

* Altenburg and Zweibrücken are no longer classified as regional airports (since 2015).
Global passenger traffic increased by 6.5 percent, the strongest rate for five years. According to IATA, lower ticket prices are an important reason for this trend. Freight rates, however, clearly fell short of this value. They only rose by 2.2 percent over the year across all regions.
On the ground, too, minimum distances need to be maintained. In the protected area of a surface designated for the take-off and landing of aircraft, the presence of other aircraft or vehicles is not allowed. If this does happen, this is called a runway incursion. Every runway incursion is recorded and analysed.

The Risk Analysis Tool is also used when runway incursions are assessed. In 2015, 111 runway incursions occurred at German airports, ten of them involved DFS. Only four had an effect on safety. As a new system of categorisation was used, the results cannot be compared with those of previous years.

The percentage of delayed flights in German airspace is very small. In 2015, only 1.8 percent of flights were affected by air traffic flow management (ATFM) measures, for example due to bad weather, capacity bottlenecks at airports or high traffic volumes. The average ATFM delay in German airspace decreased to 19.2 seconds. The share of delays attributable to air navigation service providers is even smaller: 7.2 seconds. The figure shows the punctuality in Europe’s ten countries with the highest traffic volumes.
In 2015, three out of five flights departed on time or even before the scheduled time. Every fifth flight departed with a delay of more than 15 minutes, for example as a result of a delayed arrival, ground handling delays or due to bad weather.

Two out of every five aircraft docked at the gate ahead of schedule. Efficient ground handling processes at the destination aerodrome, favourable wind and weather conditions and direct routings contribute to punctual arrivals.
According to the Federal Statistical Office, 76.7 percent of all seats in aircraft over Germany were occupied in 2015. This is a record high. The load factor of aircraft departing from and arriving at German airports is one fifth higher than twenty years ago.

Long-distance flights to San Francisco as well as flights to tourist destinations in Spain, Greece and Portugal have the best load factor. Overall, the load factor for flights abroad amounts to 78.3 percent. These figures are based on flight destinations with over 1,000 flights per year.

DFS air traffic controllers also keep an eye on the environment. Deviations between the direct route and the flight routes they assigned amounted to 3.7 kilometres on average, which corresponds to a detour of merely 1.2 percent. These figures do not include the immediate vicinity of airports, where avoiding unnecessary aircraft noise for residents and ensuring the separation of aircraft on final approach have a higher priority.

Every second flight in Germany is conducted by members of the three alliances: the Star Alliance (including Lufthansa, etc.), SkyTeam (KLM, Air France, etc.), and oneworld (American Airlines, British Airways, etc.). Airlines from the Gulf region are on the rise. Since 2005, they have doubled their share.
London is Europe’s airport capital. With the airports of Heathrow, Gatwick, Stansted, Luton and the City Airport, London has an annual average of more than 1,500 departures per day. These figures refer to IFR flights; included are airports at a distance of up to 50 kilometres with at least one aircraft movement per day.

Source: EUROCONTROL 30 Mobility Report 2015 - Airlines