



Background info on the FABEC Feasibility Study





Straight to the point

How FAB Europe Central can change the way we fly

Air traffic trends in Europe

Airspace in Europe has one of the highest traffic densities in the world. A very large part of the traffic is concentrated in six countries: Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland.

Half of all flights in Europe take place here, at the heart of the continent. The airspace, totalling 1.7 million square kilometres, is characterised by closely interlaced civil and military traffic and rising air traffic volumes. In 2006, about 5.3 million civil and military flights were controlled in this area.

Experts agree that the volume of traffic will continue to grow. They have calculated that by 2018 the number of civil and military flights in the six countries could grow by nearly 50 per cent. This means that there could be between 7.2 million and 7.8 million flights in the same, limited airspace.

This increase would cause considerable problems if nothing were done in the meantime. Without major changes in air traffic management, the aviation system as a whole will suffer. The airspace will even be more crowded and more flights will be forced to deviate from optimal routes and from desired schedules. This means more delays for the passengers, higher costs for the airlines and a negative impact on the environment.

The idea

While on the ground, in most European countries, passport controls at national boundaries have been abandoned without interfering with national sovereignty, air traffic management and air traffic control are still mainly organised according to national boundaries. This affects the way the routes cross borders. National air navigation service providers are responsible for air traffic control in the national airspace – for training and qualifying their own staff, for running its own technical systems, and for calculating individual user charges. This is working well today, and in some cases cross-border services do take place, in the framework of international arrangements, mostly bilateral, but will it continue to work well in the future?

Experts agree that while air traffic continues to grow, the boundaries in European airspace could be a constraint on this growth. In order to create more capacity, to minimise delays and to improve the flight efficiency of civil flights and mission effectiveness of military flights and to strengthen the cost





effectiveness, fragmentation in airspace and air traffic management has to be brought to an end. So-called «functional airspace blocks» (FABs), where airspace design is oriented towards traffic flows and not towards national boundaries, should be introduced instead – without interfering with national sovereignty. This idea is part of the Single European Sky in line with the European Community Regulations 549/04 to 552/04 adopted in 2004. Although Switzerland is not a member of the EC, it participates in the SES project.

The idea is promising. But what advantages will a FAB bring?

A Feasibility Study points the way

To get an idea of the potential of such a functional airspace block the civil and military authorities of Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland together with the air navigation service providers designated in these States launched, at the end of 2006, a feasibility study concerning the creation of a functional airspace block in the heart of Europe, FAB Europe Central (FABEC). The governments of these States are aiming at a performance-based approach which will increase the performance of the air traffic system within their region. Up to 230 experts from the various organisations shared their expertise and in 18 months they created a common perspective for the future of airspace and air traffic management. Together they developed a multitude of proposals for the different areas of investigation. In addition, they combined these proposals with expert-based assumptions and analysed their potential benefits. These results are summarised in a Feasibility Study Report which was delivered in summer 2008.

The findings of the study

The main proposals of the FABEC Feasibility Study are as follows:

• New airspace design

The design of the FABEC airspace should be improved for civil routes and sectors as well as for military training areas.

The route structure should be optimised irrespective of national borders. This would make it possible to accommodate the expected traffic growth, reduce the workload of air traffic controllers and increase the options for military training.





- **Common operational concept**

The FABEC region should be seen as a single continuum of airspace. A common civil-military operational concept should be introduced. This will contribute to improving capacity, flight efficiency and subsequently the impact on the environment. In particular, common FABEC flow and capacity management, including civil and military flights, would be a big step forward.

- **Common safety management**

The safety management systems of the individual air navigation service providers should be harmonised. A common safety management system at FAB level should be introduced. This will lead to improvements in safety in the whole FABEC area.

- **Common technical systems**

The fragmentation of technical systems in the FABEC area should be overcome. Future developments should aim at creating common technical systems and common technical support services.

- **Common charging scheme**

User charges should become independent of national borders. The whole FABEC airspace should enter a convergence scheme in order to constitute a single charging zone with one common unit rate. This would make it easier for the users to choose the shortest routing – to reduce their costs while benefiting of the environment.

- **Cooperation in training**

Implementation of a common operational concept and convergence in technical systems and services will offer opportunities for cooperation in the area of training. This will improve cost-effectiveness.

An example

A central aspect of all of these proposals is the fact that the experts have been seeking common solutions from the very beginning – for all countries regardless of national borders, and at both civil and at military level. The so-called "hot spots" show how important this approach is. This term designates the areas around the internal borders of the FABEC area characterised by high traffic volumes. In the border area between Belgium, France, Luxembourg and Germany, for example, arrivals and departures to and from Frankfurt and Brussels meet with a large number of transit flights. In addition,





there are several military training areas in this airspace that are in fact used only to a limited extent by civil air traffic. Today, different control centres control this relatively small airspace despite the complex situation. The national borders also often define the control sectors of the national air navigation services, without always fully reflecting the air traffic flows.

In the light of these conditions, experts have proposed that airspace be regarded as a single continuum from the beginning. In the future, control sectors should be based on traffic flows rather than on existing national borders. Air traffic routes could then be planned in such a manner that they coincide as closely as possible with the so-called great-circle routes. In daily operations, it will be possible to direct traffic flows so as to minimise or avoid overload situations in the entire FABEC area.

These various measures will lead to significant improvements as they add up. This effect, however, can be exploited only if airspace is designed jointly and if all parties involved work in accordance with a common operational concept.

The areas of potential identified

Safety first

Safety is the first priority in managing air traffic. Consequently, it has been clear from the beginning that FABEC can be established only if the current high level of safety can definitely be maintained. The Feasibility Study indicates that with FABEC, the current high level of safety can be maintained despite the growing traffic volume. This means that flying in Europe will remain safe in the future.

FABEC can reduce delay

At present, shortages in air traffic control (ATC) capacity play only a minor role in air traffic delay. This, however, might change in the future. Without FABEC, the growth in air traffic could lead to a massive increase in ATFM delays - waiting time imposed on some flights in order to avoid overflowing ATC capacity in any piece of airspace. The experts forecasted that in 2018, 33 per cent of flights might have to be delayed due to ATC capacity. Introducing FABEC can significantly reduce ATFM delay. According to the FABEC Feasibility Study, in 2018 only 1 per cent of flights could be delayed for ATC capacity reasons.

FABEC can improve flight efficiency

The route network design must take into account several requirements, such as minimum spacing between two parallel routes, and between two crossings, avoiding areas where military training is taking place. This means that





deviations from the great circle, which is the shortest line between two airports, are inevitable, but they have to be reduced as far as possible.

In 2006, the average route extension in the FABEC area was 53 km (28.6 nautical miles) per flight. Introducing FABEC can reduce deviations from the direct route. According to the FABEC Feasibility Study, it is envisaged that the maximum benefit in terms of flight length in 2018 will be a reduction of 17.4 km (9.4 nautical miles) compared to today.

FABEC can make flying greener

The Feasibility Study shows a potential to reduce the fuel burnt per flight by 72 kg compared to today. This is equivalent to a reduction of emission per flight of 226 kg CO₂ and 0.7 kg NO_x.

The savings are even higher if you were to compare this to the evolution without FABEC.

FABEC can reduce costs

The Feasibility Study indicates that the costs will go down. Less fragmentation and improved cooperation will lead to a reduction in costs for en-route services. Based on the proposals made in the Feasibility Report and some expert-based assumptions financial experts deem that the potential net profit value for the FABEC project will be between €3.6 billion and €9.8 billion by 2025, but is most likely to be in the region of €7 billion.

The next steps

The Feasibility Study clearly shows that FABEC is feasible and that FABEC has the potential to improve the current situation, well in line with the objectives of the Single European Sky expectations. All partners from the six nations welcome the results of the Feasibility Study Report. They are, indeed, already one step ahead – preparations for the future have started.

In order to guarantee the benefits estimated in the study, the implementation requires a dual approach. The States authorities involved, having analysed the study, signed a Declaration of Intent on 18 November 2008. To create the final institutional basis, they will prepare a State Agreement, which is expected to enter into force in 2011. Before FABEC can be implemented, the States have to examine a number of issues in various fields such as legal aspects, regulation and oversight, decision-making. They also have to decide how the military are to be involved in the various cooperation models in order to enable a more flexible use of the FABEC airspace for military and civil aircraft.

Meanwhile, the air navigation service providers will in parallel start a set of activities which can be carried out immediately. The air navigation service providers will thus enhance their cooperation immediately in appropriate areas





where no State Agreement is needed, such as training or the common procurement of technical systems.

In addition, in order to avoid wasting time, preparatory steps for the implementation of key functions, such as internal FABEC cross-border airspace and air traffic flow management, will be taken as soon as possible. All these measures will be defined in a formal agreement between the air navigation service providers.

Both sets of activities will be brought together in a common project framework which will guarantee the success of FAB Europe Central.

FABEC promises first results in a near future and has impressive potential. The States involved intend to apply the performance-based approach. In this respect, they have expressed high level aspirational goals, under a set of medium and long-term targets. The States will monitor the results of FABEC on an annual basis and will work on performance targets that will contribute to the results of the project. These targets will be coordinated with performance targets at a European level.

FABEC is ready for departure. Now it just has to take off.

