



## The Control Tower at Brussels Airport

For optimal safety of air navigation

Belgocontrol is an autonomous public company with the mission to guarantee the safety of air navigation in the civil airspace for which Belgium is responsible. We also manage the air traffic at and around Brussels Airport and the four regional public airports of Antwerp, Charleroi, Liege and Ostend.

## Setting a standard beyond Europe

Building the control tower at Brussels Airport that was officially inaugurated in 2005, was a unique opportunity to integrate the most recent technology for air traffic control, to optimise the visual observation of air traffic and to completely rethink the ergonomics of the working stations. Moreover, all services involved in air traffic control were brought together in the same building: air traffic control and management, software development, as well as meteorological and aeronautical information services.

The control tower not only allows Belgocontrol to smoothly manage traffic at the airport, but also to keep pace with the development of Brussels Airport and the evolution of air traffic, while maintaining the highest safety standards – the top priority for Belgocontrol.

Presently, the control tower of Brussels Airport sets a standard for the rest of Europe and the world to follow. The expertise acquired during the whole project and its implementation established Belgocontrol as an international leader in managing similar large-scale projects that perfectly combine building aspects, equipment integration and operational concepts of 'tower' air traffic control. We are therefore proud to be in a position to offer our competences to potential external customers.

*All the supporting services for tower traffic control are brought together in the building at the foot of the control tower.*



## An extraordinary building

It only took two years' work for the control tower to be completed. The building consists of the actual tower and, at its foot, a trapezoid building with a surface area of 3,500 m<sup>2</sup> on three levels. 7,600 m<sup>3</sup> of concrete were used to build the tower, 820 tonnes of reinforcement, 105 tonnes of metal structure, over 4,000 m<sup>2</sup> of glazing and 725 m<sup>3</sup> of masonry.

The shaft of the tower has nine sides in order to reduce to a minimum the interference of electromagnetic reflections. The tower stands on a foundation plate which has a diameter of 20 metres, and is 1.8 m thick. It rests on 26 poles, each with a 1.2 m diameter and with a depth of 6 metres, that is to say, a maximum carrying capacity of 8,350 tonnes.

Special attention has been paid to the architecture and to the quality of the materials so that the control tower is a perfect reflection of the excellence of Belgian air traffic control and has become a favourite meeting point for the European aeronautical world.

*Technical rooms as well as a resting-place floor for the air traffic controllers are situated between the operational and training visual control rooms and the meteorological observation post.*

## An ideal tool

The control tower is ideally situated as regards the runways, the taxi tracks and the parking zones at Brussels Airport. The air traffic controllers have a maximal view of all ground movements, as well as of all take-offs and landings. The operational visual control room is more than 60 metres above the ground, has a diameter of 18 m, boasts 12 working stations for the air traffic controllers and has a visual range of 360°.

A training visual control room with similar features and located just below the operational one, is used for the training of air traffic controllers and for preparing and testing technological developments. It can also be used for operational purposes, if needed.

The meteorological service is also situated in the tower building. The observations are made from a height of 35 m, thus ensuring an ideal cover.

## Cutting-edge technology

The most recent technological innovations are to be found in the control tower. They are based on international concepts all pursuing safety improvement and anticipating the expected air traffic growth.

The A-SMGCS concept (Advanced Surface Movement Guidance and Control System) aims at permanently ensuring assistance to tower air traffic control tasks, also when weather conditions are unfavourable.

This concept was given shape thanks to:

- ground and air sensors (ground radars, multilateration) with data processing systems enabling air traffic controllers to follow up and identify aircraft at and around the airport on their screens with great precision;
- the “Software Development” service of Belgocontrol that developed functions such as Control (securing the take-off runways), Routing (choice of taxiways), Guidance (guiding the pilot from the ramp to the take-off runway) and Planning (planning of the best sequence order of departing aircraft). This service will continue to develop and improve these functions.





*The most recent technological systems and working positions, of which the ergonomics have been thoroughly studied, offer the best support for tower air traffic controllers to carry out their tasks.*

The CDM concept (Collaborative Decision Making) strives to increase efficiency at the airport by optimizing the exchange of information between the various operational partners : air traffic controllers, the airport operator, airline companies, handlers, etc.

The implementation of this concept has been extended by the exchange of information with other airports and Eurocontrol.

The CPDLC concept (Controller Pilot Data Link Communication) gradually replaces voice communication between the pilot and the tower air traffic controller by datalink, a more reliable means of communication for the exchange of routine information.

All the functionalities following either the A-SMGCS, the CDM or CPDLC concepts are systematically integrated - as a coherent and efficient whole - in the AMS (Airport Movement System), the automatic flight plan processing system that Belgocontrol developed in-house thanks to our operational and technical experts.

In terms of technological innovation for tower air traffic control, Belgocontrol is one of the leaders internationally and makes sure that it complies at all times with the requirements of the Single European Sky project.



*The control tower at Brussels Airport is a perfect reflection of the excellence of Belgian air traffic control.*



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