

*the safety maker in aviation*

# *Obstacle Risk Assessment and Electromagnetic Compatibility Studies of ATC Facilities at Airports*



in cooperation with



**Flight Calibration Services**

## Obstacle Risk Assessment and Electromagnetic Compatibility Studies of Buildings near Air Traffic Control Navigation and Surveillance Facilities at Airports

Both the construction of large, modern buildings with innovative facades and complex geometry and wind energy plants with their rotating blades can lead to the impairment of navigation and surveillance facilities. They can have a detrimental effect on the performance of Air Traffic Control facilities, which in turn might endanger the safety of flight operations, especially near aerodromes. These constructions may generate unintentional reflection, refraction or attenuation resulting in malfunctions of these technical facilities (radar, ILS glide slope and localizer or en-route facilities such as VOR). Objects beyond the formal protective areas surrounding these Air Traffic Control facilities can also cause malfunctions according to ICAO EUR DOC 015 (European Guidance Material on Managing Building Restricted Areas).



Glide Slope Transmitter Frankfurt Airport, Runway Northwest (Photo: FCS)

Furthermore, projected buildings at or near aerodromes may conflict with obstacle clearance requirements according to ICAO or EASA in Europe.

Consequently, regulations require that such buildings, including the construction of new buildings or the renovation of existing ones, be secured and protected while

considering, for example, local approach and departure procedures as well as other safe flight operations. We at the **Gesellschaft für Luftverkehrsforschung GmbH (GfL)**, in cooperation with our partner **FCS Flight Calibration Services GmbH**, offer you exactly these comprehensive expertise in flight guidance, flight operations and high frequency technologies in order to then give you a competent, state-of-the-art risk assessment. Our uniform assessment methodology has been successfully applied in numerous projects. In addition to that, FCS provides simulation solutions for electromagnetic phenomena using their longstanding expertise in high frequency technology. Along with risk assessment studies, we offer the following core services:

In addition to risk analysis, we provide the following core services within the scope of radar signature reports:

- An advising planner and architects to optimally locate, orient and surface intended buildings in a construction zone who will help you comply with the various ICAO requirements for obstacle and radio magnetic clearances directly in the planning phase.
- Continuous monitoring of construction projects with regard to their impact on Air Traffic Control facilities.
- Execution of validated simulations in the MHz/VHF (ILS) and GHz/UHF (radar) frequency range covering Near- and Far-Field phenomena to determine potential interferences of the construction site on demand.
- Specific attenuation measurements of construction materials and facade elements in order to perfectly emulate their true reflective characteristics for the evaluation process.
- Early and continuous coordination with the responsible authorities (e.g., ANSP) to ensure approval.
- Development of a risk and interference mitigation plan if required.

**The GfL expert team can find an individual solution for each of your particular problems – always seeking to keep your costs and time low!**

### Our Experiences:

For over 20 years GfL has actively provided professional counseling and expert opinions within the fields of safe flight operations and aerodrome and ATM planning pro-

cedures. We have supported numerous companies with their projects, comprehensive plan approval procedures and court hearings.

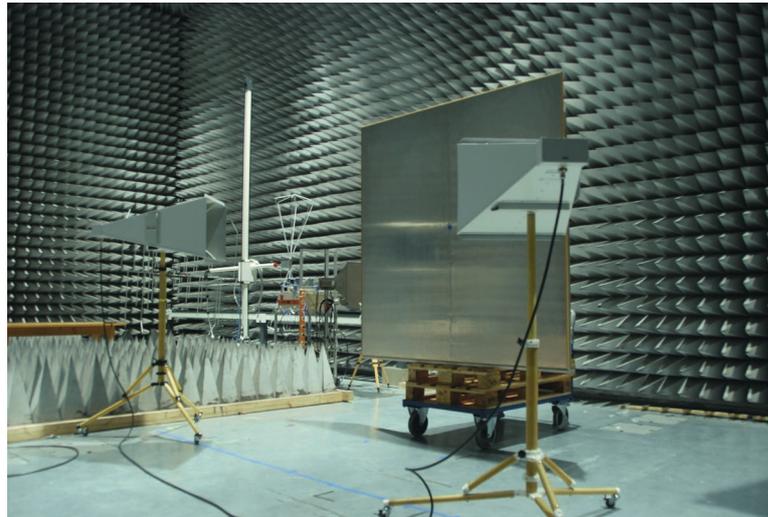
FCS has longstanding experience in the field of flight inspection and expertise in radar signal analysis. For the continual improvement of our services, both companies regularly exchange knowledge and findings with ATC organizations, airports and regulators.



*Localizer Braunschweig (Photo: FCS)*

A large number of reference projects at major European airports are proof of Gfl's experience and FCS' expertise. Gfl and FCS have jointly developed a unique and highly effective method for evaluating the electromagnetic interference potential of buildings and structures at ATM facilities, including the following core aspects:

- High-performance simulations using the best hybrid numerical simulation software available today.
- Use of a comprehensive antenna database for navigation and radar systems.
- Validation of simulations with flight inspection measurements of major European airports.
- Correct modelling of measured facade elements, RF properties and consideration of „real world“ performance of receivers and aircraft antennas.



*Laboratory tests for the determination of the attenuation properties of facade elements (Photo: Gfl)*

With these competencies, we enable you a reliable, high-precision and unique approach resulting in effective project processing and short project durations!

#### **Selected References:**

- Compatibility study for radar and ILS at Frankfurt Airport – renovation of building 201 (Fraport AG 2017)
- Compatibility study for radar and ILS at Frankfurt Airport – new construction of fire station 03 (Fraport AG 2016)
- Electromagnetic compatibility report for the Gateway Gardens area in the vicinity of Frankfurt Airport (Grundstücksgesellschaft Gateway Gardens GmbH, since 2011)
- Wind park Raßnitz in the vicinity of Leipzig/Halle Airport (e.n.o. energy GmbH, 2010 – 2013)
- WERAN – Interaction between wind energy plants and radar/navigation; investigation project of the interfering effect of wind energy plants on radar systems (since 2013)
- MOSTDONT – Investigation of the interaction between secondary radar Mode S interrogators and transponders in an interfered environment (EASA, 2010)

**The Gfl and FCS team looks forward to providing you with expert advice and solutions for your building concerns. For more information, find us at [www.gfl-consult.de](http://www.gfl-consult.de) or contact us directly at [info@gfl-consult.de](mailto:info@gfl-consult.de).**



**GfL** Gesellschaft für Luftverkehrsforschung mbH

Hermann-Prell-Straße 8  
01324 Dresden

Telefon: +49 (0) 351 2732603  
Telefax: +49 (0) 351 2732604

E-Mail: [info@gfl-consult.de](mailto:info@gfl-consult.de)  
Internet: [www.gfl-consult.de](http://www.gfl-consult.de)