Lightning Protection at Düsseldorf Airport

Based on DGUV Information 214-038

Emily Less | Arbeitsschutzmanagementbeauftragte | 13.11.2025

Background & Relevance

- Thunderstorms pose serious risks to airport operations
- Employees on the apron are exposed to lightning hazards
- DGUV 214-038 provides practical guidance for protection measures
- Düsseldorf Airport has implemented a structured safety protocol

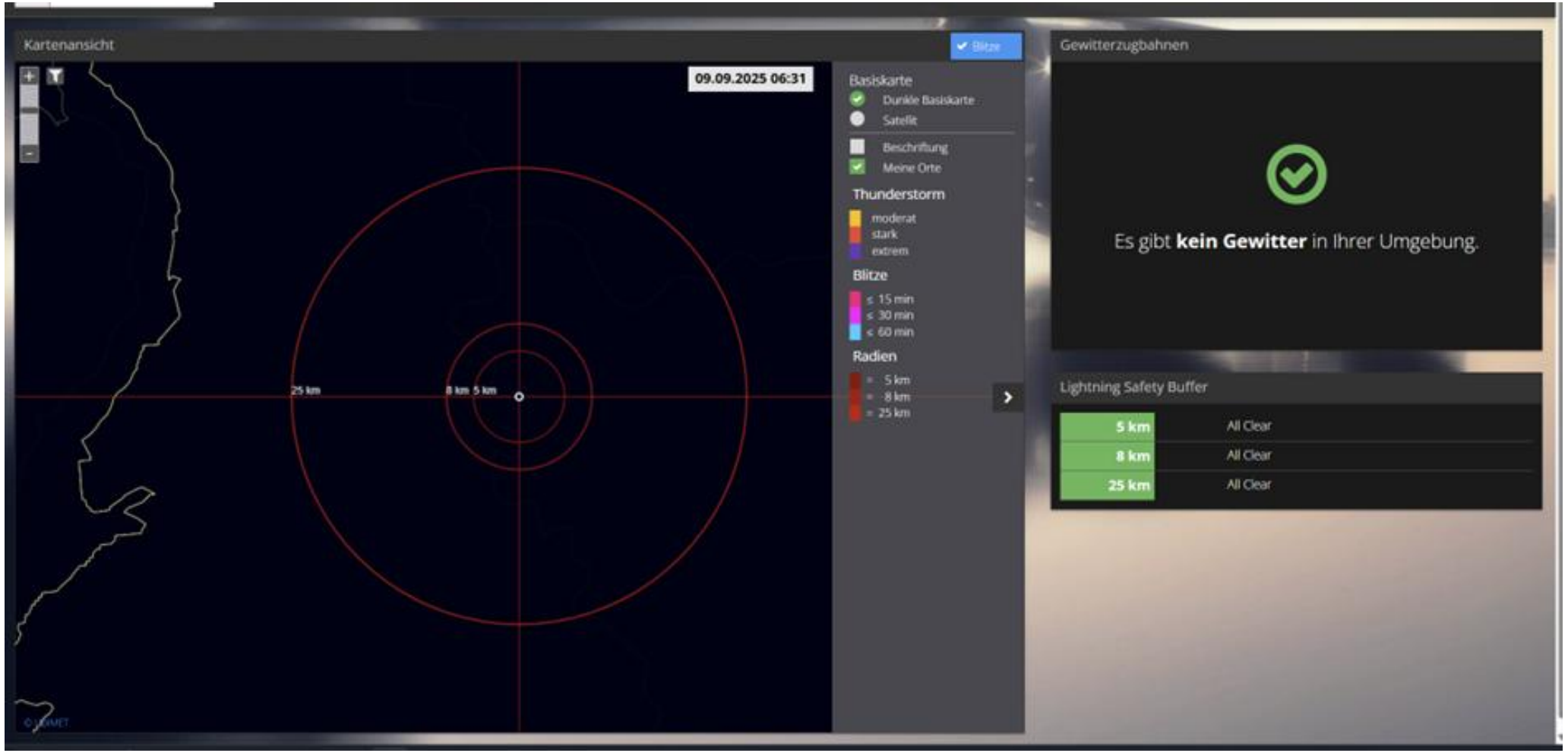
Warning & Detection System

We currently use two devices at the airport to assess the risk:
- Information from the German Weather Service
- and the field mills (which I will explain on the next slides)

- Four-stage warning model:
  1. **Pre-warning** (lightning within 25 km)
  2. **Warning** (lightning within 8 km)
  3. **Alarm** (lightning within 5 km)
  4. **All-Clear** (no lightning since 9 min within 5 km)

- To contact people, we have set up automated alerts via Rapidreach (email and mobile devices).

German Weather Service

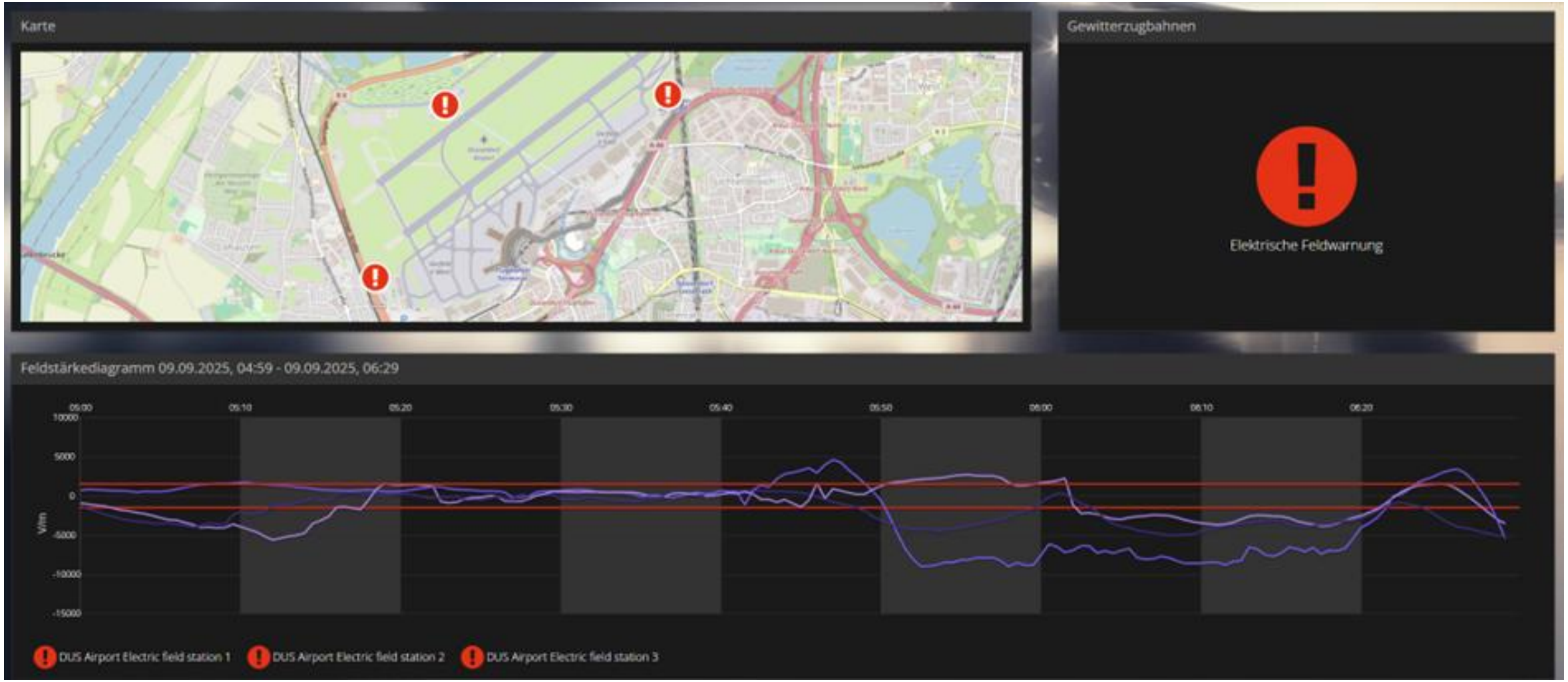


Field mills

- Measuring electrical voltages in the air
- Predict lightning strikes and lightning types in the surrounding area
- Installation of 3 field mills at the DUS airport
- Six-month training on the system

Positioning field mills

and field strength diagram



Düsseldorf Airport DUS

Diskription Field mills

Field mills contain sensors that measure the electric field of the atmosphere, helping to detect thunderstorms and decreasing or increasing storm intensity earlier and assess the situation more accurately.

Inside the field mill, a motor rotates a grounded impeller over two electrically isolated sector surfaces. The induced charge density in the two sector surfaces now fluctuates between zero and a maximum surface charge density.

This is how the electrical charge of the atmosphere is calculated.

What are our next steps?

- As one of the first airports in Germany, Düsseldorf Airport is focusing on a combination of field mills, the German weather service, warning lights and horns in order to respond even more precisely to critical weather events.

- Due to climate change, these events are already occurring twice as frequently as in 2021, and the trend is continuing to rise.

- Thanks to the mills, which measure tensions in the air, the arrival and departure of the lightning risk can be measured precisely. The teams on the field are immediately informed by sound and light signals whether it is safe to work.

What are our next steps?

- This protects the crews on site and at the same time prevents unnecessarily long interruptions in operations, for example, additional weather-related delays can be avoided.

- In the future, intelligent sensor technology will also contribute to making winter road maintenance even more precise.

Measure

- Equipped with red lights and a horn
- Providing audio-visual storm warnings and all-clear signals
- Prevent communication delays between airport and handling partner
- Each aircraft position receives a flashing light

Summary

- Lightning protection is a critical part of airport safety
- DGUV 214-038 provides a solid framework
- Düsseldorf Airport follows a proactive, structured approach
- Safety of all employees working on the ramp is the top priority

Düsseldorf Airport DUS

Contact

Emily Leß

B.Sc. Qualität, Umwelt, Sicherheit und Hygiene
Arbeitsschutzmanagementbeauftragte

T +49 (0)211 421 - 21 431
H +49 (0)152 3467 0214
emily.less@dus.com

Düsseldorf Airport DUS

Thank you for your attention