

Enhancing Safety at Bilbao Airport with WindCube® Scan Airport Edition

VAISALA

Case Study



The client:

Spanish Meteorological Agency (AEMET)

Vaisala solution:

WindCube Scan Airport Edition

Bilbao Airport, located in the Basque Country of Spain, faces significant challenges due to its geographical setting. Surrounded by mountains, the airport is particularly prone to severe wind conditions, especially during autumn. This results in frequent turbulence and windshear, complicating both landings and takeoffs.

To address these challenges, the Spanish Meteorological Agency (AEMET) installed Vaisala WindCube Scan Airport Edition, a state-of-the-art scanning wind lidar designed to improve safety and operational efficiency.

THE CHALLENGE:

Complex topography and false alarms

Mountainous terrain, including the prominent Archanda range, creates unpredictable and strong wind conditions at Bilbao Airport, particularly when southwest winds collide with the mountains.

The frequent windshear events pose a substantial risk to aircraft safety, with operations heavily reliant on pilot experience and communication. Previously tested systems resulted in numerous false alarms because they could not accurately differentiate between surface winds and the winds encountered by approaching aircraft. This exacerbated the challenge, as pilots had to navigate with limited reliable data on wind conditions.

THE APPROACH:

Modern wind lidar for exceptional accuracy

To mitigate these challenges, AEMET deployed WindCube Scan Airport Edition at Bilbao Airport. This advanced sensor is designed to provide precise, real-time wind data, significantly enhancing the airport's safety protocols.

Key features and benefits:

Real-time wind data collection: WindCube Scan *Airport Edition* utilizes a constantly rotating laser to gather comprehensive wind data. This allows for the accurate detection of windshear and turbulence at various altitudes and distances from the airport.

Enhanced pilot communication: With reliable wind data, pilots are better informed about the wind conditions they will encounter during approach and landing. This reduces their dependence on anecdotal information from other pilots and enhances overall safety.

Reduction in false alarms: Unlike previous systems, WindCube Scan *Airport Edition* minimizes false alarms by accurately differentiating between surface wind conditions and those encountered by aircraft in the approach phase. This ensures that the warnings are relevant and timely, improving response times and safety measures.

Data-driven safety: AEMET now has a fully operational warning system capable of transmitting reliable alerts to pilots and ground control.

THE RESULTS:

Demonstrable safety for today and the future

AEMET has determined the most effective methods for transmitting alerts and integrated them into the airport's safety protocols. The successful implementation of WindCube Scan *Airport Edition* has significantly reduced the

frequency of dramatic windshear incidents, ensuring safer and more efficient operations at Bilbao Airport.

The solution represents a significant advancement in aviation safety. By providing precise, real-time wind data, this cutting-edge technology helps mitigate the risks associated with the airport's challenging geographical conditions.

AEMET's proactive approach in utilizing advanced wind lidar technology demonstrates a commitment to enhancing both safety and operational efficiency, setting a new standard for airports facing similar challenges worldwide.

Why Vaisala?

For over 45 years, Vaisala has been a pioneer in aviation weather technology, ensuring that every measure is taken for unparalleled safety, efficiency, and sustainability.

Our gold standard suite of solutions is trusted in more than 170 countries and over 2000 airports globally. In fact, every commercial flight around the world will use weather observations produced by Vaisala equipment or forecasts driven by our sensor measurements at some point in their journey.

With a commitment to constantly evolving our portfolio, Vaisala remains at the forefront of the industry, continuously exploring new horizons.

