SCANTER 4002
Wind Farm Tolerant ATC Radar
Wind Farms and ATC Radars

Wind turbines are great contributors in harvesting renewable energy. However, when grouped in large wind farms, they can have a significant effect on radars and specifically long range Air Traffic Control Radars (ATC Radars) used for aviation as they are typically designed to show only moving objects and filter out anything stationary. The large size of wind turbines causes them to reflect a large amount of radar energy, and the spinning blades of the wind turbines can appear on the radar screen as false air targets or lead to track seduction of existing tracks. Furthermore, the interfering radar echoes generated by the turbines can desensitize the radar in the area of the wind farm causing legitimate targets to disappear.

These issues have an impact on a safe and reliable radar surveillance, which in turn affects the deployment of wind farms. The wind turbine interference with radars is one of the main causes for military and civil aviation authorities to object to planned wind farms. Several wind farm projects have been delayed or cancelled due to this issue.

A mitigating solution that is capable of detecting legitimate air targets in wind farms while at the same time filtering all unnecessary noise is in strong demand to overcome the concerns from military and civil aviation authorities. Terma’s wind farm tolerant ATC radar – SCANTER 4002 – will get the job done.

REPLACEMENT OR GAP-FILLING RADAR

The SCANTER 4002 performance has been demonstrated on several occasions to be superior in wind farm radar surveillance.

The SCANTER 4002 can be used either as gap-filling radar or replacement radar in ATC applications. As gap filler, the radar supplements an existing ATC system and can be located outside the wind farm for full vertical coverage of the wind turbine area.

The 40 nmi coverage range of the SCANTER 4002 facilitates co-location with a Terminal Approach Radar (TAR) while providing radar augmentation. Co-locating the radars drastically reduces the integration issues associated with the gap-fill/infill concept. Depending on range requirements, the SCANTER 4002 could even replace a TAR and thereby further reduce or eliminate integration issues.

VERSATILE AND FLEXIBLE RADAR

The instrumented range of the SCANTER 4002 air coverage is up to 40 nmi for ATC applications, equivalent of up to 17,200 km² of wind farm surveillance; covering one or more wind farms at the same time.
FROM GREENLAND AND ANTARCTICA TO THE TROPICS OF ASIA
The SCANTER 4002 is the latest version of the SCANTER 4000 series of radars which are off-the-shelf products and operating in various areas of the world.

The SCANTER 4002 radar sensor is an X-band, two dimensional, fully coherent pulse compression radar providing both MTI and normal radar (Non-MTI) video simultaneously.

The SCANTER 4002 Transceiver is designed for detection, separation, and tracking of small air targets and large surface targets like wind turbines. To achieve simultaneous good performance for air and surface detection, the SCANTER 4002 radar system features both high transmit power and extreme receiver dynamic range (+110 dB).

INTER-TURBINE VISIBILITY
The high spatial resolution (6 m range cells) combined with low range and antenna side lobes ensures superior detection of small air targets, e.g. general aviation aircraft and helicopters, without degrading sensitivity in and around wind farms.

High resolution CFAR processing and an enhanced tracker (ET2) enable target detection and tracking of aircraft over wind farms.

PROVEN AND RELIABLE
Most of the world’s largest ports and airports are already relying on a Terma surveillance or security solution, given our 60 years of experience in detecting very small land, sea, and air targets in extreme weather and sea conditions.

KEY BENEFITS
- Wind farm tolerant ATC Radar
- Inter-turbine visibility
- Small target detection and enhanced tracking over wind farms
- Proven technology
- Can be used either as gap-filling radar or replacement radar in ATC applications
- ASTERIX data output for easy integration
- Up to 40 nmi detection range (ATC applications), 17,200 km² coverage
- Up to 40,000 ft. vertical coverage
Operating in the aerospace, defense, and security sector, Terma supports customers and partners all over the world. With more than 1,100 committed employees globally, we develop and manufacture mission-critical products and solutions that meet exacting customer requirements.

At Terma, we believe in the premise that creating customer value is not just about strong engineering and manufacturing skills. It is also about being able to apply these skills in the context of our customers’ specific needs. Only through close collaboration and dialog can we deliver a level of partnership and integration unmatched in the industry.

Our business activities, products, and systems include: command and control systems; radar systems; self-protection systems for ships and aircraft; space technology; and advanced aerostructures for the aircraft industry.

Headquartered in Aarhus, Denmark, Terma has subsidiaries and operations in The Netherlands, Germany, India, Singapore as well as a wholly-owned U.S. subsidiary, Terma North America Inc. Terma North America Inc. is headquartered in Arlington, in the Washington D.C. area, with other offices in Georgia, Texas, Alabama and Virginia.