

Radar impact assessment services in action

French national meteorological service:

QinetiQ was the first company to be authorised to assist the French Government in the assessment of proposed wind farms and their potential to interfere with weather radar. We worked closely with the French national meteorological service, Météo-France, to predict radar interference with the high degree of accuracy that the government required to allow planning permission for wind farms.

Field trials:

We led and participated in a wide range of field trials to understand the impact of wind turbines on electromagnetic systems, such as marine radar systems, secondary surveillance radar, and civil aviation air-ground-air radio communications.

Wind farm legislation:

To support the development of wind farm legislation, our experts have collaborated with regulatory

institutions and government organisations, such as the UK MOD, NATS, RenewableUK, Météo-France and the UK Maritime Coastguard Agency.

Stealth turbines:

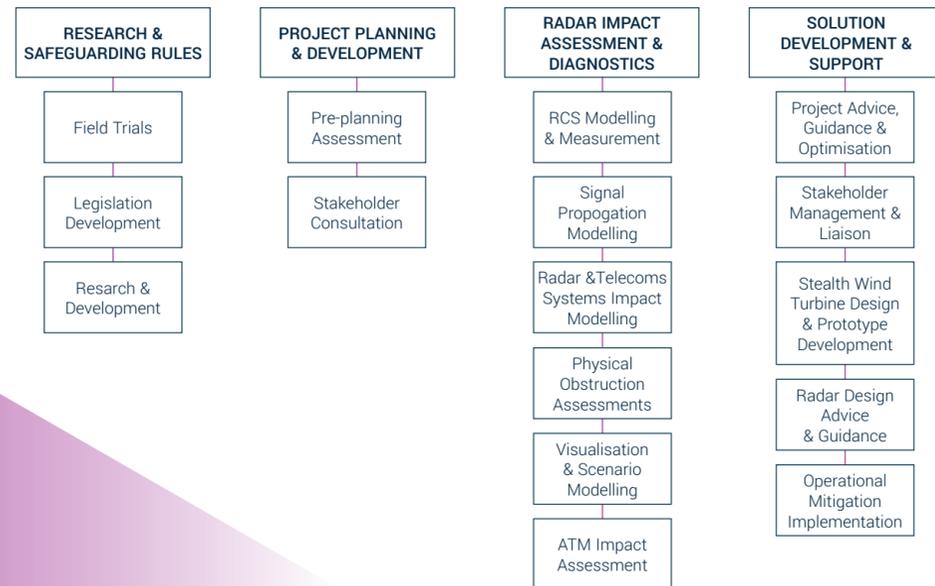
Our Radar Impact Assessment team has designed and supported the manufacture of stealth turbines for the world's first operational stealth wind farm, the Ensemble Eolien Catalan.

Offshore projects:

We have supported and authored Radar and Aviation chapters for the Environmental Impact Assessments of several offshore wind farms. The QinetiQ VRSim shows how new projects will appear on maritime and vessel radar systems, and was used to demonstrate the impact on shipping of the USA's first offshore wind farm, Block Island, commissioned in 2016.



QINETIQ RADAR IMPACT ASSESSMENT SERVICES



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QinetiQ Radar Impact Assessment Services

Delivering proven radar impact assessment services to the global wind farm industry

Leaders in wind farm radar impact assessment

The QinetiQ Radar Impact Assessment (RIA) team assesses the impact of wind turbines on radars and telecommunication systems.

QinetiQ's deep understanding of radar design and reflectivity measurements, Air Traffic Management, material design and characterisation, and military and civil communications has been developed over many years – we have performed over 600 studies for 200 customers in 26 countries.

We offer independent expert analysis and advice on impact assessment and mitigation, which has supported many of the world's leading wind farm developers, such as Dong, EDF, EON, RES, SSE and Vattenfall. We also offer services to small scale wind farm developers, and radar and aviation stakeholders, such as the UK MOD, Eurocontrol and Belgocontrol.

Our wide range of radar impact assessment services include:

- Research and safeguarding rules
- Project planning and development services
- Radar impact assessment and diagnostic services
- Solution development and support services
- Cost reductions based on delivering pre-planning advice early in the project lifecycle
- Removal of planning objections by demonstrating that likely impacts are acceptable

QinetiQ's radar impact assessment services are delivered by highly qualified and experienced engineers and associated staff, underpinned by cutting edge facilities, equipment and software. This includes an extensive suite of software tools, developed and validated over decades of use for radar and material design running on advanced supercomputing facilities with security accreditation.

Our facilities

Based at secure facilities in the UK, QinetiQ has an extensive range of software tools supported by advanced supercomputing capabilities.

Our software includes:

- Advanced electromagnetic (EM) modelling toolset
- Radar signal propagation (NEMESIS)
- Weather radar modelling (CLOUDSIS)
- Primary radar interference and saturation model (PRISM)
- PSR/SSR shadowing and SSR bearing error tool (UMBRA)
- Pre-planning assessment tool (PPA)
- Line of sight and terrain analysis model (Terrain Viewer)
- Marine radar scenario modelling (VRSim)

Radar Cross Section modelling:

- CAD software (PATRAN, Solid Edge) for importing and processing accurate 3D models
- Suite of RCS modelling tools (SPECTRE) for predicting the RCS at various frequencies

Visualisation:

- Bespoke Google Earth tools for visualising the impacts
- Photorealistic visualisation using industry standard CGI software (3ds Max)

Measurement facilities for RCS characterisation:

- Small anechoic chambers
- Large outdoor facilities
- Portable radar systems for in-situ measurements

Our people

UK based but internationally deployed, the team has over 15 years' experience in delivering radar impact assessments. The team has background expertise in electromagnetic theory, radar design and material behaviour, applying methods developed for civil and military applications to understand how wind farms interact with radar systems, and how to mitigate issues arising. All our staff hold UK Defence Security clearance.

The team has worked with hundreds of industry stakeholders and legislators and built an excellent understanding of the requirements and constraints of wind farm developers and the radar and telecommunications industries. Our people have learned to bridge the gap between stakeholders, and developed expertise in explaining, quantifying and finding solutions to impacts.

Furthermore, the RIA team can call on a wide range of relevant QinetiQ experts in areas such as Air Traffic Management (former Air Traffic Controllers), ATC surveillance systems and data processing, radar reflectivity measurement, radio communications, radar design and material design.

