



Stealth Wind Farm

QinetiQ provides stealth materials for EDF's wind turbines

Executive summary

QinetiQ applied its vast experience in stealth technologies to the wind farm sector. Working alongside EDF Energies Nouvelles and turbine manufacturer Vestas, we integrated an innovative material that is applied without structural change to wind turbines to reduce their radar signature by up to 99%. This technology enabled France's largest wind farm to be installed without significant interference to the weather radar located nearby.

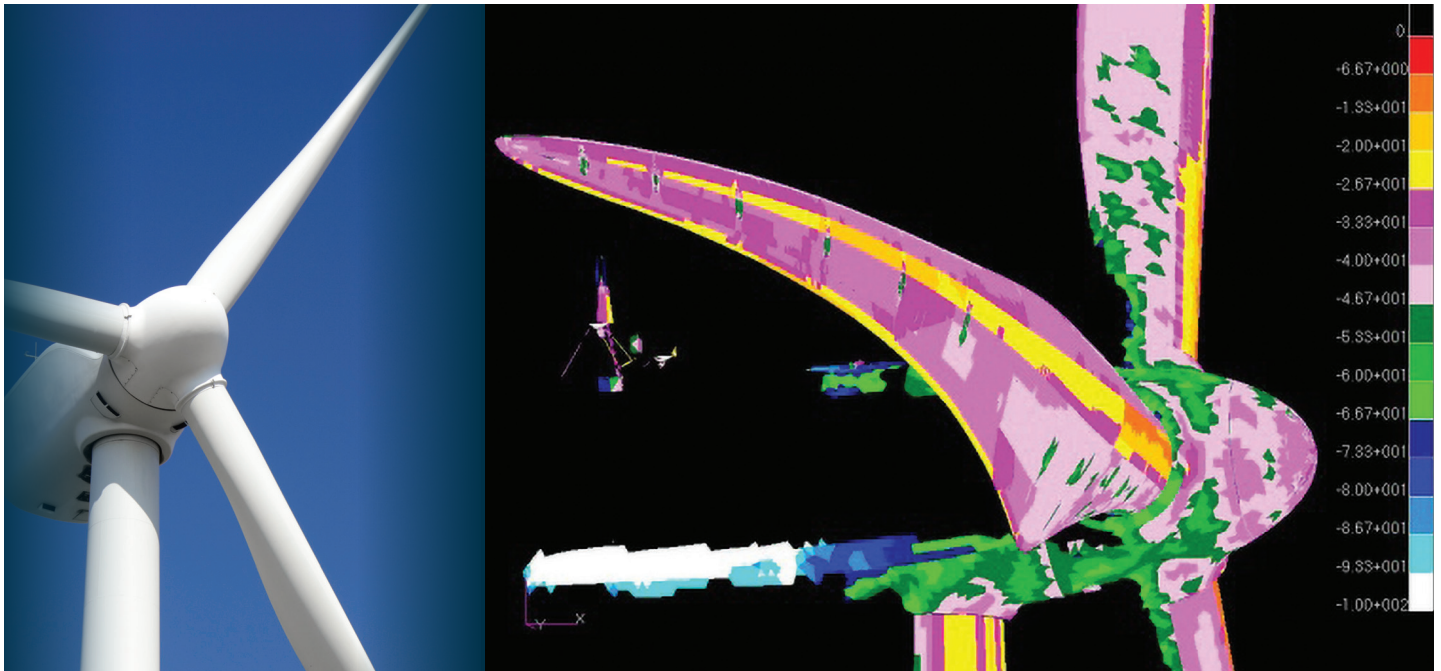
“ EDF took a chance on a brand new solution to a problem that has limited renewable energy adoption for many years. That pioneering spirit has enabled us to produce world-first technology that has exciting implications for the future of this industry as a whole. The complexity of this project has demanded unparalleled innovation, and we're very proud to see the result of that work in the commissioning of this wind farm. ”

Thierry Le Gall, QinetiQ

The brief

Around the world it is increasingly difficult to find suitable areas for the development of wind energy. In France, around 80% of wind farm planning applications are currently refused if they are near to French weather radars. This is due to the interference caused by wind turbines to radar measurements. The signals reflecting off the tower and moving blades are indistinguishable to the radar from objects such as rain or hail that they are designed to detect.

EDF Energies Nouvelles, the renewable subsidiary of EDF, had to find a way to reduce this impact of turbines on radar systems that would enable the coexistence of the Ensemble Eolien Catalan Complex wind farm, made up of 35 turbines, and the Météo France weather radar located 22km away.



Our solution

QinetiQ was able to utilise years of stealth expertise and research to develop lightweight, radar absorbing materials that could integrate with the turbines supplied by Vestas. This innovative solution was a world first, and demonstrated excellent enhancement and application of what was originally defence technology.

Radar impact assessment modelling, prototype manufacturing and testing using our multiband portable radar confirmed that our stealth solution could be integrated into the turbines without significantly altering their physical characteristics or manufacturing process.

Outcomes and benefits

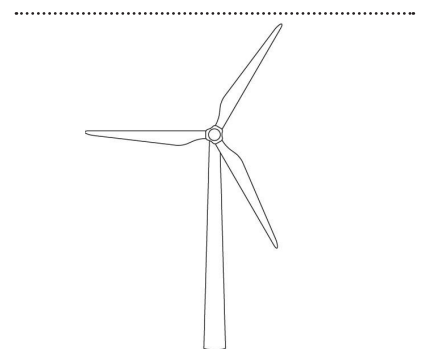
The application of QinetiQ's stealth technology to these turbines achieved a reduction of up to 99% of radar interference. As a result, the Ensemble Eolien Catalan wind farm was able to be installed near Perpignan in June 2016 – within the coordination area of

the Opoul weather radar – with minimal impact. This 35 turbine wind farm is the largest in France, and generates power equivalent to the annual electricity consumption of 120,000 people.

Our innovative patented technology is enhanced with a well-established material supply chain, and represents a breakthrough for the wind energy sector. Radar weather stations are just one example of a system that could be detrimentally impacted by wind farms; other objections come from military and airfields where radar is essential – QinetiQ's technology can diminish this threat by making the apparent radar signature size of the turbine much smaller, giving stealth wind turbines a chance to thrive in what were previously unobtainable areas, and coexist with existing facilities.

QinetiQ is proud to have successfully worked in partnership with EDF Energies Nouvelles and Vestas to tailor our research and expertise in defence stealth technology to enable

a renewable energy source for both our customer's and the environment's advantage. There is also great potential for the application of this technology across other industries around the world.



QinetiQ's stealth materials reduced radar interference of wind turbines by up to 99%

For more information, contact customercontact@QinetiQ.com

QinetiQ is always on your side, protecting, improving and advancing your vital interests

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