



Dedicated to innovation in aerospace

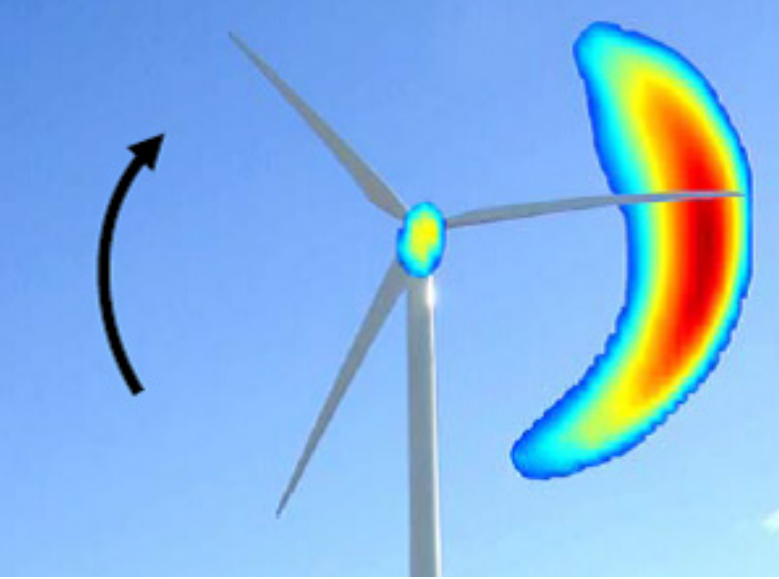
Wind energy and aerospace research

PRODUCTS & SERVICES



Dealing with the public, safety and noise

Public acceptance, being compliant with safety regulations and noise reduction measures, play an important role in the realisation of wind turbine projects. People are concerned about the noise and visual appearance. Wind turbines near airports may pose a safety hazard to aviation; collision risk and disturbance of radar, navigation and communication systems. Wind turbine noise has to be reduced. NLR offers solutions for all three of them.



WHAT YOU NEED

- Objective assessments and demonstration of the noise and visual characteristics of a wind turbine (site)
- Dedicated safety assessments in areas where aircraft operations are an important factor, such as near airports and approach routes near oil/gas platforms.
- Solutions for the technological challenges in wind turbine development and operation

WHAT WE DELIVER

- A virtual environment for visual and auditive demonstrations, which can be used in support of societal acceptance
- Safety assessments for (Inter)national customers
- Objective analyses of the acoustic characteristics of a wind turbine
- Localisation methods pinpointing noise sources and support in the development of noise reduction devices without compromising energy production.

OUR CAPABILITIES

Environment

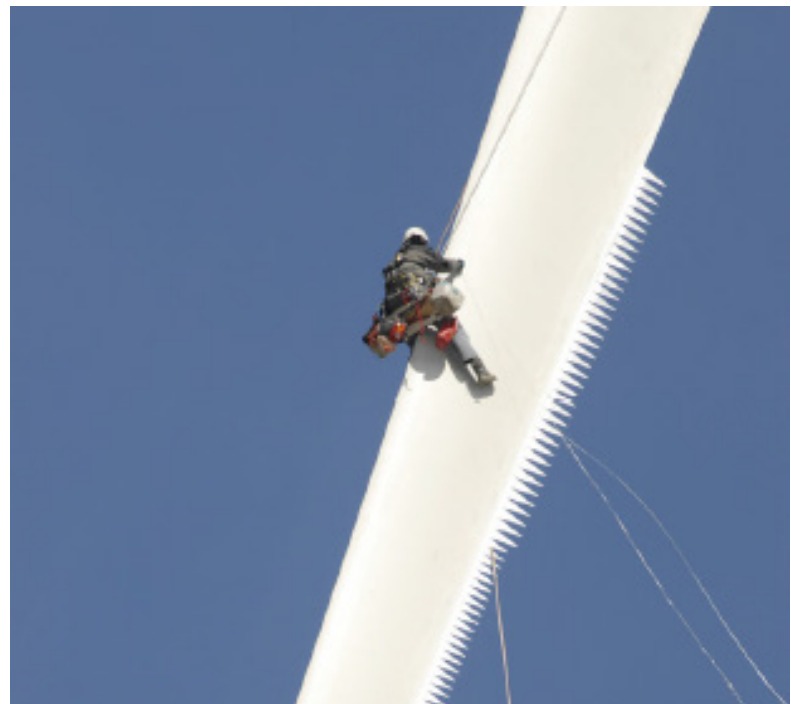
Demonstration of visual and auditive characteristics of a wind turbine in NLR's Virtual Community Noise Simulator (VCNS). Assessment of acoustic signatures and the perception of wind turbine sound. Noise source localisation and field testing.

Safety

Safety and risk assessments for wind turbines near an airport. Aeronautical Studies to reduce the environmental impact of aircraft warning lights. Definition of the operational limitations for helicopter aerial servicing operations on wind turbine parks. Application of 'Drones' near wind turbines, including training and legislation issues. Assessment of aircraft/helicopter operations near wind turbine wakes.

Technology

Noise reduction techniques with test facilities including an anechoic wind tunnel. Blade profile design. Blade aero-elastic loads and fatigue analyses with appropriate testing facilities. Manufacturing and application of state-of-the-art composite materials, light construction methods and 3D printing techniques. Blade erosion, icing and lightning protection advice.



PRODUCTS & FEATURES

The Virtual Community Noise Simulator objectively supports public acceptance of wind turbines. Thorough knowledge of the aircraft operations supports successful integration of wind energy in areas with aerospace activities. Innovative technology from the aerospace domain lowers your Levelised Cost of Energy.