

## WIND FARM LIFE EXTENSION

RES carried out a life extension review of a 15 year old wind farm in France. The 16 turbine wind farm had planning permission for up to 25 years and the client wanted to understand how to optimise project performance and what options were available to enhance production for the remaining operational life.

RES' own methodology assessed whether the main structural components of wind turbines, for example foundations and towers, would continue to support turbine operation beyond the initial design life.

### SAFETY FIRST

Using operational data and maintenance logs we analysed the historical operating conditions of each turbine and compared it to the design assumptions. This way, we identified which turbines, and which structural components, had experienced the most severe loading and then predicted future structural fatigue. Furthermore, we inspected the foundations and measured the towers' structural health with portable sensors to provide further assurances. Having identified the failure risk of each component, recommendations were made for those that we deemed critical, including ongoing inspection regimes.

### INCREASING PROJECT YIELD

Having established the safety margins of the turbines, we went on to identify which components could be refurbished to improve the project business case. We looked at operating data, carried out Failure Modes and Effects Analysis (FMEA), and discussed with component manufacturers and parts providers to find, and cost, potential upgrades.

In total, 15 improvements were carried out with a total payback period of only 3 years. The retrofits ranged in size, for example, the entire turbine controller was updated to improve reliability and reduce downtime. Additionally, we adapted the service maintenance tasks to concentrate on high risk components.

The combined effect of physical inspections, engineering assessments and commercial cost-benefit analysis has proved the case for enhanced yield right through to the end of the planning permission.

### FIND OUT HOW WE CAN IMPROVE YIELD AND EXTEND WIND FARM LIFE

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Our expertise in structural engineering and wind resource measurement was key to developing a rigorous methodology.



Assessing wind farm life with a risk based approach gave assurance to the client.