

## GL GARRAD HASSAN TRAINING COURSE Advanced Use of WindFarmer Software

Date: 13 February 2014

Course location: Bristol, England

### TRAINING FROM THE EXPERTS IN WIND ENERGY

GL Garrad Hassan offers professional training courses developed in-house, which are delivered by experienced trainers who have the support of GL Garrad Hassan's unparalleled experience in the wind industry.

GL Garrad Hassan analyses about 30,000 MW of new projects every year and has undertaken energy assessment of around 25% of all projects worldwide. We have advised on more wind farm developments than any other company in the world.

#### Advanced use of WindFarmer

This course goes beyond our introductory level courses to look at some advanced features of WindFarmer software. We will discuss how to improve the accuracy of your results, and how to calculate more than just your annual energy production.

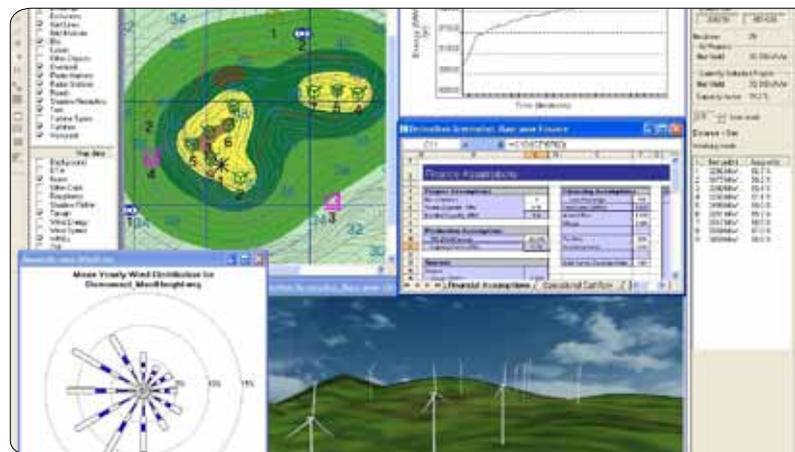
WindFarmer is widely acknowledged as a powerful piece of software, and an increased understanding of its functionality will help you to leverage your investment.

In the morning we will look at how to make the most of the features which give WindFarmer its accurate modelling:

- its range of wake models leads the industry, and we will discuss how to select the one most appropriate for your wind farm;
- the 'Association Method' is a technique which eliminates the errors typically introduced when a wind speed frequency distribution is approximated to a Weibull distribution;
- noise propagation modelling is increasingly important, and we will look at how to design a turbine layout in a noise constrained area using WindFarmer's layout optimiser.

In the afternoon, we will discuss the range of outputs which WindFarmer can generate and how these can be used for energy analysis, operational diagnostics and short term forecasting. This will centre around the 'Flow and Performance Matrix', part of the Turbulence Intensity module. This matrix, when combined with a little post-processing in Excel, can be used for many tasks such as:

- a 12 x 24 table of wind farm output through the day and across the year;
- prediction of wind farm output for a given wind speed and direction;
- modelling the effect of wind farm curtailment.



#### Who Should Attend?

This course will be of interest both to experienced users of WindFarmer, and to users of other software thinking of making a switch. It incorporates "hands-on" exercises with the software.

#### Equipment

Please bring a laptop computer for the Advanced Use of WindFarmer course. We will show you how to install WindFarmer on to your computer at the start of the day, if required.

#### Price:

**SPECIAL OFFER: book on or before 20 January 2014 and the price is:** €600 (exc VAT)

If you book after 20 January the price is: €700 (exc VAT)

Places are limited, so please book early.

**Course location:** Bristol, England

#### Registration Contact Details

Andrew Brown, Training Manager, for general enquiries and to book on the course.

Julian Pett for queries on content.

Please E-mail: [training.era@dnvgl.com](mailto:training.era@dnvgl.com)

## Advanced Use of WindFarmer Programme

09:45 Coffee and registration

10:00 Introduction

Using the Association Method

Choosing the right wake model

11:30 Coffee

Noise propagation and layout optimisation

13:00 Lunch

Introducing the Flow and Performance Matrix

Power output for a given wind condition

12 x 24 power output table

15:30 Coffee

Curtailement modelling

Q&A session

16:30 Close