ECN Wind Energy Industrial Support

EWIS

Being one of the leading institutes on wind energy research, ECN has established the new EWIS (ECN Wind Industrial Support) group in 2009 to better bring the R&D results to the market. During the last three decades, ECN has developed expertise on aerodynamics, structural analyses, turbine control, offshore operation and maintenance, and grid connection. With the growing wind industry, ECN received more requests for assistance and EWIS has become the vehicle to support the wind energy industry in their product developments.

EWIS's focus is on the high end of the market which means that we will make use of tools and knowledge that have been developed in-house and include the latest R&D results!

The EWIS team is a mixture of young professionals and experienced researchers which ensures a fast response and high quality.

More information
Ir. L.W.M.M. (Luc) Rademakers
Head of EWIS Group

ECN Wind Energy
P.O. Box 1, 1755 ZG Petten, The Netherlands
tel. +31 (0)224 564943
fax +31 (0)224 568214
e-mail: rademakers@ecn.nl
www.ecn.nl/ewis

Training in Aerodynamic Design Tools

Purpose
The purpose of this training is to get acquainted with the ECN Aerodynamic Design Tools.

The Blade Optimisation Tool BOT for wind turbine aerodynamic rotor design calculations. BOT optimises the rotor geometry for maximum annual energy yield for a given wind climate, airfoil information and structural limits such as radius, maximum chord and its locations, maximum twist and thickness. As a result of optimisation, the optimal chord and twist distribution, the optimal pitch settings, and the optimal tip speed ratio of rotor blades are found. Either active pitch or passive stall regulated wind turbines, both with constant, double or variable rotor speed can be modelled in BOT.

The Aerodynamic Table Generator (ATG) is a tool for generating aerodynamic coefficients for wind turbine rotor blades from 2D airfoil wind tunnel test data. It is possible to remove the laminar drag bucket of the drag coefficients and include the 3D corrections to lift and drag coefficients by ATG. This tool is also used together with BOT.

RFOIL3D is a 2D panel/boundary layer coupled solver which models the flow around an airfoil including 3D rotational effects to the boundary layer. The resulting aerodynamic forces are calculated, as well as the pressure distribution over the airfoil.

The noise emission of a blade is calculated with the **SILANT** code. Noise levels are calculated by using the sectional information of the blade and the given operating conditions. This code can be used together with RFOIL3D.

Although the use of these programmes is largely self-explaining, training is offered for these aerodynamic blade design tools, where the focus of the training is on active participation by the trainees.

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Target Group:	Wind turbine (blade) designers that plan to use the ECN software products BOT, ATG, SILANT or RFOIL.
Required educational level of attendees:	Engineering level. No aerodynamic expert knowledge is required but basic knowledge of mathematics and physics is expected. Some basic aerodynamic knowledge is preferable.
Track record:	ECN has given this lecture to several industries. The lecture material is developed and is given by specialists with experience in wind turbine aerodynamics.
Minimum/maximum number of participants:	Due to the intense character of the course, it is best given to small groups.

For more information about this training, please contact:

Ir. O. (Ozlem) Ceyhan
tel. +31 (0)224 568265
e-mail: ceyhan@ecn.nl

The training is organised as follows:

BOT and ATG

For the Blade Optimisation Tool BOT and the Aerodynamic Table Generator ATG a one-day training is offered. A short introduction to the tools is followed by an intensive hands-on training session, where an aerodynamic design is practised so that all aspects of these codes are covered.

In addition to this course, EWIS offers a two-days wind turbine aerodynamics and blade design course. This course includes the theoretical background of wind turbine aerodynamics.

SILANT and RFOIL

For SILANT and RFOIL a one-day training is offered. The morning is spent first receiving a theoretical overview about RFOIL and airfoil analysis followed by lectures related to noise generated by a wind turbine and its prediction. In the afternoon, hands-on training sessions are performed to cover all the aspects of these programs. As final practice, the participants will perform aerodynamic and acoustic calculations on a realistic blade and the results are discussed.