

Overview Tutorials 13 October 2009, Bremen

Basic Track

Key Audience for Basic Track: Beginners in the area of wind turbine modeling.

Session A

(1) Overview of Wind Turbine Technology (E. Tröster & T. Ackermann, Energynautics)

General overview of basic wind turbine principles (Betz law etc.), wind turbine components and status of technology.

The different drive train systems used in modern wind turbines will be discussed in detail. The main parts of the drive train are the gearbox, the generator, and the converter. The focus will be put on important properties related to wind turbines, such as costs, efficiency, controllability, and the ability to comply with grid codes.

Session B

(1) Basic Overview of Wind Turbine Models (E. Tröster, Energynautics)

In this tutorial the basic principles of wind turbine models used for grid integration studies will be shown. Different components of wind turbines, such as generator, gearbox, and converter, for instance, will be discussed with respect to modeling issues. Depending on the respective wind turbine technology, these components will be combined and equipped with different controllers, to control speed, torque, and power.

(2) Modeling Wind Turbines in Digsilent (N. Martensen, Energynautics)

This tutorial starts with a short introduction to the DigSILENT PowerFactory power system simulation software. Wind turbine models can be implemented using the DigSILENT simulation language (DSL). After an introduction to DSL, the modeling of a complete wind turbine system will be shown, consisting of the aerodynamical part, and the mechanical and electrical parts.

(3) Modeling Wind Turbines in PSS[®]E (Ralph Hendriks, Siemens)

Details to be announced soon

(4) Validation of Wind Turbine Models (Mark Meuser, Forschungsgemeinschaft für elektrische Anlagen und Stromwirtschaft e.V. [FGH])

In order to derive correct conclusion from wind turbine simulations, it is necessary that the models be validated against real-world data. Only then it can be estimated how close the simulation results will be to the actual behavior in the field. The validation process includes setting up tests to gather the required data, processing the measured data, and comparing the recorded data to simulation results. These steps will be discussed, taking the relevant IEC and FGW standards into account.