Overview of DOE project entitled: “Documentation, user support, and verification of wind turbine and plant models”

Project Background and Objective:

Despite the large existing and planned wind generation deployment, industry-standard models for wind generation have not been formally adopted. Models commonly provided for interconnection studies are not adequate for use in general transmission planning studies, where public, non-proprietary, documented and validated models are needed. NERC MOD reliability standards require that power flow and dynamics models be provided, in accordance with regional requirements and procedures. The goal of this project is to accelerate the appropriate use of generic wind turbine models for transmission network analysis. Through the developments and activities proposed for this effort, transmission planning engineers will be able to confidently apply the generic models for network studies involving commercial wind turbines sold into the U.S. market, in full compliance with NERC (North American Electric Reliability Corporation) standards and guidelines.

The project objective will be accomplished through execution of the following initiatives:

- Defining proposed enhancements to the generic wind turbine model structures that would allow representation of more advanced features such as power control, automatic curtailment, inertial and governor response;

- Comparative testing of the generic models against more detailed (and sometimes proprietary) versions developed by turbine vendors;

- Developing recommended parameters for the generic models to best mimic the performance of specific commercial wind turbines;

- Documenting results of the comparative simulations in an application guide for users;

- Acquiring test data from all available sources for the purpose of validating the performance of the appropriately specified generic models in actual case studies;

- Conducting technology transfer activities in regional workshops for dissemination of knowledge and information gained, and to engage electric power and wind industry personnel in the project while underway.