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**New England Interconnection Workshop:  
Wind Developers, Wind OEMs and ISO New England**

May 14, 2012  
10:30 a.m. – 5 p.m.  
Foley Hoag  
155 Seaport Boulevard, 13<sup>th</sup> Floor  
Boston, MA

**A. Overview**

1. ISO to OEM: Review of interconnection process, requirements and deadlines
2. OEM to ISO: Identify information OEM can provide to ISO
3. Wind developers to all: overview on generic project timeline from project conception through commercial operation

**B. Wind Plant Modeling**

1. Aggregate modeling - When is using an equivalent generator model sufficient and when/why would all individual turbines need to be modeled? What are the concerns with each method?
2. Turbine models versus plant models - How should ISO take the plant supervisory controller into account in their studies? Individual turbine models are typically used in interconnection studies, when and how should higher-level plant controllers be incorporated into the studies?
3. Where are the manufacturers in the process of developing generic models?

Wind plant modeling papers by OEMs provided for reference during discussion:

- “WECC Wind Power Plant Dynamic Modeling Guide”
- “WECC Wind Power Plant Power Flow Modeling Guide”
- “Model Validation for Wind Turbine Generator Models”
- “Validation of GE Wind Plant Models for System Planning Simulations”
- “Standard Models for Variable Generation”
- “Reactive Power Interconnection Requirements for PV and Wind Plants – Recommendations to NERC”

**C. Wind plant modeling data**

1. Improving communications between ISO, developers and OEM; teleconferences versus email.

2. Submission of late or inaccurate non-functioning wind plant models; Development of a data repository (modeling data) to reduce delays and improve quality of data.
3. Can ISO data needs be encapsulated in the Attachment A data request or some other form to ensure developers know what information to provide? How can the form address unit specific models that keep evolving?

#### D. Proprietary Data

Discussion on OEM proprietary data about its units and ISO's requirements to share system reliability data; release of information in a timely manner and what information can OEM provide? Discuss proprietary and generic models.

#### E. Planning and Operating Criteria

1. Do ISO procedures and reactive power issues allow for equivalent modeling of the plant instead of detailed modeling of each turbine?
2. Discussion of issues on voltage and distant turbines. Compare ISO's experience with specific operating wind plants compared to its expectations based on the interconnection studies for those plants.
3. Explain the ramifications of units tripping offline for high or low voltage (or other conditions). What are the ramifications for the tripped wind units themselves? How harmful is a unit trip? What other system conditions cause undesirable conditions at the wind plant? What are the recommended bounds for operation and what are the impacts on the wind plant if those bounds are exceeded?
4. Can OEM's provide a standard response rate for wind parks responding to voltage dips (e.g., number of seconds for the park to move to full reactive output)? Discuss creation of standard definitions across the industry similar to excitation systems. When can ISO consider wind parks to be truly in a voltage control mode? How fast does the control work?
5. When the ISO uses a combined model and the unit trips or doesn't trip, what does that mean for the individual turbines? Does that mean that none of the turbines will trip? A few? Less than half? When a simplified model is used, how should ISO interpret the results?
6. Discuss when the developer should provide the ISO with information on the voltage limits on the collector system.

#### F. Technology Advances

Adding more flexibility in the Interconnection Procedures for wind developers; discussion on avoiding disruption and increased delays and costs particularly for later-queued projects. Developers and OEMs to explain reasons for model and design changes. ISO discuss the implications of making changes at different points in the interconnection process.

#### G. Planning versus Operating Studies

When the interconnection study is done and I.3.9 approval is received, developers and OEMs generally assume that interconnection will proceed without additional requirements being identified. How do ISO operations studies differ from planning studies? When are they performed?

What are the potential results? What lessons can be learned from past experience? How can developers and OEMs be better prepared for this?

#### H. Interconnection Standards

Will there be interconnection standards for wind generation akin to previous standards for synchronous generators?

#### I. Alternative models of interconnection planning or planning studies that will increase efficiencies for greater variable resource integration