



UWIG Program Activities: Member Initiatives & Networking

***Incentives & Opportunities for
NW Public Power Sector***

**J. Charles Smith
Electrotek Concepts, Inc.**

WPA/UWIG/NWPPA Public Power Wind Workshop

April 23, 2001

Portland, OR

UWIG Program Status Report

- Needs of members drive program
- Opportunity for technical exchange and networking
- Major activities identified over multi-year period
 - ❖ Resolution of Transmission Issues through NWCC
 - ❖ Contribution to IEEE P1547 Interconnection Standard
 - ❖ Impact of Wind Plants on System Operation
 - ❖ Impact of Wind Generation on Distribution Systems
 - ❖ Opportunities for Hydrogen Storage with Wind Power



Resolution of Wind Transmission Issues through NWCC

- **Wind Transmission Case Studies**
- **NWCC RTO Principles**
- **Wind Transmission Workshops**
- **Topical Issue Briefs**
- **Midwest RTO Updates**
- **PJM Information Memorandum**

Topical Issue Briefs

- Issues critical to fair treatment of wind in evolving markets
- Issues include:
 - ❖ Transmission Planning Process
 - ❖ Balancing Markets
 - ❖ Real-time Scheduling
 - ❖ Markets for Transmission Rights
 - ❖ Interconnection Standards/Policies
 - ❖ Congestion Management
 - ❖ Rate Pancaking



Contribution to IEEE P1547 Interconnection Standard

■ Scope

- Establish criteria and requirements for interconnection of distributed resources (DR) with electric power systems

■ Purpose

- Provide a uniform standard for interconnection of distributed resources with electric power systems
- Provide requirements relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection

■ Current Status

- Document is in Draft #7
- Went to ballot on Feb. 26, 2001
- Next meeting: April 18-20, 2001, New Orleans, LA

■ Key Technical Areas

- General requirements (voltage regulation, grounding, monitoring, etc.)
- Response to abnormal conditions on the utility (voltage disturbances, faults, etc.)
- Power quality (harmonics/flicker)
- Islanding

Impact of Wind Plants on System Operation

- Topic identified through utility survey as most significant issue affecting large scale integration of wind power
- Satisfactory resolution will enable deployment of significant amounts of wind capacity in the near term
- Xcel Energy (NSP) and BPA have agreed to serve as host utilities and provide data for the study.
- NREL developing valuable hi-resolution data which will be helpful
- Operations planning tools & methodologies need to be modified

Impact of Wind Generation on Distribution Systems

- Identified by UWIG members as primary topic for 2001
- PQ issues of voltage flicker and voltage regulation in addition to normal DG interconnection issues
- New tools required to study unique characteristics of wind combined with power system analysis techniques
- Information resources and software application tools will be developed

Information Resources

- **IEEE P1547 Application Guide for Wind Generation**
 - ❖ Standard establishes interconnection criteria & requirements
 - ❖ Guide will show how to apply the standard as a screening tool and for specific feeder applications
- **Voltage flicker concerns, including IEC methodology**
- **Distributed wind generation installation database**
- **Case study library with technical and economic aspects**

Software Application Tools

- **Workstation implementation via CD or web-based “applets”**
- **Used for screening study or interactive design and analysis**
- **Initial tools may include**
 - ❖ Distributed Wind Generator Voltage Evaluator
 - ❖ IEC Flicker Compliance Evaluator
 - ❖ Optimal Wind Turbine Siting Evaluator
 - ❖ Wind Turbine Protection Evaluator