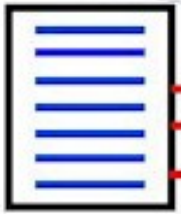

US Fuel Cell Council

Interconnect-2
Power Quality Workshop

October 16, 1998

Adam's Mark Hotel

St. Louis, Missouri

Interconnect-2

Summary Agenda

- Welcome from Mark Williams
- Mission Statement
- Identification of interconnection issues
- Interconnection Expert Panel
- Utility Interconnection Requirements
- Codes & Standards, Utility Regulation
- Priority Setting -- Group Work Session

Mission Statement

The Interconnect-2 Power Quality Workshop will provide a full day of opportunity to consider issues related to interconnection of distributed generation with existing grids. The participants will compare implementation methodologies and strategies that work. Consideration of all technologies will allow development of interconnection policy, and progress towards a unified body of interconnection standards.

Participants will be able to provide input to the IEEE and the DOE through contacts made at the workshop. The workshop proceedings will be furnished to the IEEE, DOE, the participants, and to other interested parties for their use. Participants will also be asked to help define the steps necessary to arrive at a unified body of interconnection standards with timely adoption and implementation by all utilities and other interested and affected stakeholders.

Interconnection Technology Experts

- Wind - Mike Bergey (presented by Brian Gregory); Tom Wind, National Wind Coordinating Committee
- Photovoltaics - John Stevens, Sandia National Labs; Dick DeBlasio, NREL; Tom Starrs, Kelso Starrs and Associates
- Fuel Cells - Kelvin Hecht, International Fuel Cells; Frank Goodman, EPRI; Mark Cox, EPYX
- Inverters – Mike Behnke, Trace Technologies
- Microturbines -- Warren Louis, Allied Signal

Utility Interconnection Expert Panel

- Frank Goodman, EPRI
- Brendon Kirby, NERC Policy 10 Working Group
- Tom Starrs, Kelso Starrs and Associates
- Bruce Larson, AMEREN, St. Louis (formerly Union Electric Co.)

Codes & Standards Expert Panel

- Dick DeBlasio, IEEE SA, SCC21 Chair
- Dave Conover, US Representative to IEC Ad Hoc Working Group on Fuel Cells
- Chris Melhorn, ElectroTek, IAS Power Systems Engineering Committee member
- Tony Leo, ASME PTC 50 Working Group

Utility Regulatory Expert Panel

- Syed Ahmad, Missouri Public Service Commission
- Brent Alderfer, Colorado Public Utilities Commission
- John Nimmons, CADER

Top Six Technical Issues

- Reliability & Dependability will optimize benefits
- Power Quality: harmonic distortion, power factor; voltage control, surge, lightning protection
- Safety: Protection coordination for safety, UL / ETL listing, third party testing
- "Testability": Component testing, commissioning / acceptance testing, field testing
- Dispatchability: Will distributed generation be dispatchable? Speed of response.
- Protection scheme reliability: Coordination issues

Top Six Regulatory & Policy Issues

- Exit fees / stranded cost fees / Stranded Investment Claims
- Public health and safety
- Establishing and Paying for Distribution Benefits
- Identifying and Assigning Authority
  - **FERC -- State Regulators -- NERC (via FERC)**
- Market based pricing
- Emergency Power Credit
  - **Is the grid the backup?**

Interconnect-2 Conclusions

- Distributed Resource interconnection must provide intended services to the energy services region, and to the owner, while operating with a suitable level of Reliability, Safety, and Power Quality.
- Islanding must be considered carefully.
- Suitable field testing and certification of Distributed Resources and interconnection technologies are needed to support goal #1 above.
- Certification and acceptance of protection schemes must either be built into power conditioners, or packaged as a "black box" for universal utility standard use.

Interconnect-2 Conclusions

- We must all work together to facilitate market entry for Distributed Resources
- Regulations and Policies must allow and encourage reasonable "rate based" profit incentives born by all customers for capital investments in improvements needed for Distributed Resources. These improvements might be new lines, new transformers, or other distribution equipment.

Interconnect-2 Conclusions

- Interconnection should enhance public health and safety and the environment. The goals should ensure distribution and distributed system protection, reliability, and safety, universal adoption of codes & standards, and simple certification. (CADER report)
- Regulations and Policies must provide economic incentives to all utilities for interconnection of distributed generation.
- Regulations and Policies must clearly delineate who has authority for what in a manner that provides a level playing field for Distributed Generation Resources.

Interconnect-3

- In conjunction with 1999 IEEE Industry Applications Society Annual Meeting
- October 8, 1999
- Phoenix, Arizona
- www.usfcc.com

Interconnect-3
Suggested Topics

- IEEE SCC-21 / P-1547 Update
- New York Interconnection Standards
- California PUC Distributed Generation Rulemaking
- NARUC Distributed Generation Tariff Study
- Utility Feedback
- Manufacturer Feedback
- Case Studies