Utility Relations for Onsite Power – What You Need to Know

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Northern Power Systems

We design, build and maintain on-site power systems for industrial, commercial, and government customers worldwide.

- EPC contractor and system integrator
- 30 years of experience in on-site power
- 900 systems installed in over 50 countries
- 200 employees: 50% with engineering degrees
- VT headquarters with field offices in LA, San Francisco, New York, Houston
- ISO 9001:2000 Certified

Utility Interaction

Key Points of Interaction with Utilities:

- Interconnection *(Electric, Gas, Steam)*
- Standby / Backup Tarrifs
- Data Gathering
- Utility as a Customer

Approach

What Works:

- Treat Utility as a Partner
- Technical Competence
- Get to the “Right People” ASAP
- Political Pressure (*Careful!)*

What Doesn’t Work:

- Confrontation
- Excessive Political Pressure
- Incompetence

Utility Interconnect Hurdles

- Lack of a Well-Defined Interconnection Standard
- Lack of Adherence to Interconnect Standard
- Lack of Integration
- Last Minute Surprises

Interconnection Process — Basic Protection Requirements

Visible Break Disconnect

Automatic Lockout

Anti-Islanding

Reverse Power Flow

Primary Fault Detection ***(Line—Line and Line—Ground)***

Frequency and Voltage Protection

Out of Synchronism Protection

Power Quality Preservation ***(Harmonics and Flicker)***

Fault Current Contribution Below Acceptable Limits

Interconnection Specifics — Utility Distribution

Utility Distribution is Either Radial or Networked:

Radial System

Lines Extend Radially from a Common Substation

Networked System,

Numerous Separate Lines Form a Grid

- **Area**
- **Spot**

Interconnection Specifics — Generator Type

Generator Type:

- Inverter-Based Systems

  Typically the Easiest to Interconnect

- Induction Generators

  Next Easiest to Interconnect

- Synchronous Generators are the

  Most Difficult to Interconnect

On-Site Generation Utility Concerns

- Asynchronous Generator Reclosure
- Nuisance Tripping of Network Protector Relays
- Unintended Islanding
- Backfeeding During Normal Operation
- Backfeeding on a Dead Line

Addressing Utility Concerns

- Asynchronous Reclosure
- Network Protector Over-Cycling
- Unintended Islanding
- Backfeed

Utility Standby Tariffs

- Ratchet
- Negotiable for “x” capacity
- Invest in cheap backup
- Determine critical load shedding
- Utility as a partner

Utility Data Gathering

- Interval Data
- Knowledge of all Tariffs
- Data evaluation
- Utility as a partner

Utility as a Customer

On-Site Generation Utility Benefits

- Reduced Loads on Congested Networks
- Can Forestall Costly Upgrades
- Improved Network Reliability

MEETING THE PURE POWER DEMANDS OF THE NEW ENERGY MARKETPLACE

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