

Lessons Learned Interconnecting Distributed Generation to the Vermont Power System

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Central Vermont Public Service

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Introduction

- *The SPEED Standard Offer Program [feed-in tariff] will dramatically increase interconnects*
- *The ability to safely and reliably connect new DG is critical to the successful expansion of DG in Vermont.*
- *Experience gained through recent interconnections (ie CVPS CowPower™ Program) will streamline the interconnect process for future DG*
- *Active stakeholder participation to improve the interconnection process where necessary will create efficiencies. (e.g. current PSB workshop to streamline and standardize the Rule 5.5 interconnection procedures for all generation regardless of business arrangement)*



Good Interconnection Practices

- **Safety** – DG should not create any undue safety hazards to the operator, utility personnel or the public
- **Power Quality** – DG should not cause objectionable voltage fluctuations or harmonic distortion
- **Reliability** – DG should not degrade the reliability or stability of the power system
- **Utility System Overcurrent Devices** – DG should not interfere with the operation of the utility system protection equipment
- **Equipment Safety** DG [units] should not cause damage to utility or neighboring customer equipment during operation
- **Service Restoration** – The DG unit should not interfere with restoration of power
- **Utility System Operating Efficiency** – DG systems should maintain or improve utility system efficiency



DG System Impacts to Consider

- *Voltage Regulation and Flicker*★
- *Fault Current and Over-current Protection*★
- *Grounding and Ground-Fault Overvoltages*★
- *Islanding*★
- *Harmonic Distortion*
- *Ferroresonance*
- *Stability Disturbances*



Challenges

- ***Characteristics of Vermont Distribution Systems***
- ***Integration of emerging technologies***
- ***Developing a mutual understanding of technical issues and solutions***
- ***Managing expectations***
- ***Availability of technical resources to process a high volume of requests***
- ***Timely exchange of technical information to facilitate an efficient process***



Summary

- *It is a benefit to all when DG is interconnected safely and does not impact the system negatively*
- *It is important to have a standardized and easy to administer interconnection process*
- *Due to the diverse topology of Vermont distribution systems, interconnection requirements can vary greatly based on generation size and technology, and the location of the interconnection*
- *Simplified and effective screening tools will expedite the interconnection requests*
- *Effective and timely communication between the utility and the project developer is critical to the overall success*
- *As we gain experience, the interconnection process will become more efficient*

