Distribution System Locational Performance Model

The Microgrid Resources Coalition

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Distribution System Locational Performance Integrated Model Development Project

- An integration of several models to assess the locational performance (physical and economic) of distribution level resources.

- Performance = Energy, Ancillary Services, Capacity / Reliability, Customized Distribution System Support Services, System Upgrade Deferrals, peak shaving, etc. (wholesale and retail products and services).

- Beyond constraints and deferrals to imbalances and economics.

- Performance assessed across systems (above and below the node) under different grid, market and tariff conditions.

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The Integrated Model:
A Functional Tool for Regulators

- Understand the locational performance of DER / Advanced DER providing products and services to distributional utilities and ISOs/RTOs.

- Neutral and secure modeling platform for utilities and PUCs to input distribution system infrastructure data. Model would be "open access" for stakeholders to run DER / Advanced DER penetration scenarios with economic and security constrained buildouts, without disclosing underlying infrastructure security-related information.

- Enables dockets to focus on the "plays not the playing field" and gives regulators a better view of how a smart grid develops and operates.

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The Integrated Model:
A Functional Tool for Regulators

- Allows utilities, ratepayers, DER hosts and developers to demonstrate to regulators the benefits of simple and advanced DER penetration.

- Provides justification for utilities to ratebase: (1) development of, and/or procurement of services from, advanced DER (e.g. microgrids and aggregations); and (2) the control infrastructure needed to "conduct the DER concert."

- Assists in Grid Modernization, Rate Cases, Integrated Resource Planning, System and Reliability Planning, Enhanced Product Development and overall Tariff evolution (PUC, FERC and NERC).

- Sample Current Application: Assisting IRP proceeding – Economically Constrained DER Buildout and Supply-Side Resource Projections (e.g. How much DER capacity will be dispatchable? How much acts as negative load?).

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Phasing

- Phase I – Dynamic DER Asset Economic Model (evolution of DER-CAM), initial integration of Power Flow Optimization.

- Phase II – Full Integration of Distribution System Power Flow Optimization (constraints and imbalances), Economic and Security Constrained Dynamic DER Buildouts and Load Projections.

- Phase III – Integration of Transmission System Power Flow and Optimization, Dispatch / Merit Order Modeling with distribution factors / locational performance assessed across systems.

- A multi-year project requiring substantial computing power. A potential foundation for future grid operations models.

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