

Value of a VAR

Decision of Electricity Advisory Committee to proposed White Paper

September 29, 2016

Proposals in body of paper for DOE action

Page 4:

- ▶ to act as the catalyst to direct and harness advanced efforts by academia, national laboratories, research beds, and all segments of electric grid stakeholders to fully answer the extremely complex question, “What is the value of a VAR, and how and where to best provide it?”
- ▶ championing such a complex future understanding of VARs that markets or vertically integrated utilities can provide them to the grid not as a cost of service, but on the basis of their incremental value—a complex value dependent upon specific grid location or type of location, across various times and circumstances, and under a range of grid configurations.
- ▶ Further evaluate the need for equipment manufacturing standards for PV systems, variable speed motors, lighting, electronic devices, etc.—where revised standards can provide electric system efficiency and improved reliability;

Proposals in body of paper for DOE action

Page 7: Conduct R&D to codify, standardize, further enhance, and educate the industry to stability study best practices

- ▶ Encourage educational measures... that capture and leverage a variety of sometimes competing, but equally valid, perspectives on grid voltage support—with emphasis on establishing a methodology to reach consensus on how much dynamic versus steady-state support the grid requires in a given area, and perhaps (joint or sole) delivery of industry workshops to address reactive issues and to promote a common understanding based on the best aspects of all perspectives.
- ▶ Explore continued educational measures...that specifically emphasize a range of dynamic modeling issues including, the FIDVR phenomenon and its causes, modeling, signature grid vulnerabilities, relationship to protection and control philosophies employed, and potential mitigation.
- ▶ Support R&D conducted by national laboratories and other strong theoretical academics ...to develop a common language, understanding, and a broadly supported metric to communicate the value of a VAR at any point on the grid for a reasonable variety of circumstances, which can drive incremental grid investment decisions for dynamic VARs.

Proposals in body of paper for DOE action

Page 16:

- ▶ DOE therefore needs to effect discovery and communication of the world ahead, while at the same time acting as a catalyst for “remedial” discovery and communication!

Page 23:

- ▶ DOE would be well suited to produce standardized monetized values for VAR associated with different generation technologies, and this would provide a great deal more understanding and transparency of the value of VAR. This would allow communication to policymakers and stakeholders about the alternative costs available to provide VAR within the mosaic of IRP processes.

Proposals in body of paper for DOE action

Page 24:

- ▶ DOE will not only need to educate legislators on the value of VAR, but also to provide them with tools to communicate with their constituents why VAR needs to be paid for, and about the range of policy options on who should pay and how.

Page 26:

- ▶ it is the EAC's assessment that DOE can play an important role in educating state public policymakers about the importance of voltage regulation so that states can formulate the most cost-effective approaches to developing distributed generation on the utility systems while also adopting policies that provide for the optimum level of voltage support depending upon the locational needs of the system.
- ▶ Further, it is the EAC's assessment that DOE can play a similar role where federal public policymakers are concerned.

Formal Recommendations for DOE Action

Page 28:

- ▶ Engage national laboratories like ORNL to continue researching and assessing available technologies for reactive power along with providing an assessment of the overall cost-effectiveness of competing approaches;
- ▶ Educate regulators and policymakers about the importance of reactive power on distribution systems by partnering with the National Association of Regulatory Utility Commissioners (NARUC) and hosting technical conferences and webinars;
- ▶ Further evaluate the need for equipment manufacturing standards for PV systems, variable speed motors, lighting, electronic devices, etc.—where revised standards can provide electric system efficiency and improved reliability;
- ▶ Assist in the development of load models that will help utilities forecast system requirements; and
- ▶ Assist policymakers in understanding which reliability services will need to be procured, particularly as related to the implementation of renewable energy programs that are pursued in response to federal and state mandates.

Value of a VAr White Paper - Next Steps

- ▶ Recommend Approval of Value of a VAr White paper by the Electricity Advisory Committee - Discussion