NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Policy Briefing on Reactive Power

Essential Reliability Services Working Group (May 2017)

The NERC Planning and Operating Committees jointly created the Essential Reliability Services (ERS) Working Group to identify necessary services for reliability of the bulk power system (BPS). The group has been working on these issues since 2014 and previously proposed a measure related to reactive power capabilities that are essential for the management of voltage across the system (identified as Measure 7 in earlier reports). The original concept was to compile appropriate data on reactive capabilities by balancing authority (BA) and identify informative trends in those capabilities due to changes in the resource mix. This briefing summarizes the outcome of work on this measure and describes the path forward. This policy briefing distills results from other documents and does not create new findings or recommendations. References and links to the documents are provided and these orginal documents should be consulted for additional details when needed. Voltage must be controlled to protect system reliability and move power where it is needed during normal operations and following system disturbances, and managing reactive power is the means by which system operations maintains the necessary voltage levels to ensure reliable operation. However, voltage issues tend to be local in nature, such as in sub-areas of the BPS. So, while the importance of reactive power is clear, the question was whether a measure of reactive power capability would be logical and useful for developing trends for larger areas such as a BA or interconnection.

The NERC System Analysis and Modeling Subcommittee (SAMS), with assistance from the NERC Performance Analysis Subcommittee (PAS), conducted a proof of concept data collection and subsequent analysis of the proposed Measure 7 data and reported their results in February 2017. Their findings show that at the level of a BA, the proposed measure would not provide useful, consistent and informative reactive capability trends related to a changing resource mix due to a variety of factors. SAMS further believes that the recent FERC Order 827 helps to alleviate BPS-level concerns of reactive deficiency due to a changing resource mix by requiring (consistent with earlier recommendations of the ERS Working Group) that all new resources connecting to the transmission system must have reactive power capability.

However, the ERS Working Group's "Whitepaper on Sufficiency Guidelines" (Chapter 3) discussed the importance of sub-area treatment for reactive and voltage issues, and NERC SAMS reiterated that reactive power planning practices are best applied at a local level. SAMS developed the "Reliability Guideline for Reactive Power Planning" that provides a comprehensive overview of reactive power planning techniques and industry best practices. SAMS recommended the use of this guideline, in conjunction with interconnection studies, planning assessments and operational studies that are already done as part of established NERC planning and operating standards, rather than use of proposed ERS Measure 7. The ERSWG agreed, and with the consent of NERC's Operating Committee and Planning Committee, ERS Measure 7 was withdrawn from further consideration. The ERS Working Group recommends use of the Reliability Guideline for Reactive Power Planning, applied on a sub-area basis in conjunction with existing NERC planning and operating standards, to support the reactive power needs of the BPS, thereby ensuring sufficiency and reliability with a changing resource mix.

For Further Information

Reliability Guideline for Reactive Power Planning (December 2016) is strongly recommended to ensure locally-appropriate reactive power capabilities on an ongoing basis. Also refer to Chapter 3 of the ERS Whitepaper on Sufficiency Guidelines.

Measure 7 Analysis – System Analysis and Modeling Subcommittee (February 2017) provides details on the analysis that lead to the recommendations that are described above.