

Technical Bulletin

Obligation of NERC registered PSEs and LSEs to arrange for reactive resources under NERC Reliability Standard VAR-001-2

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This technical bulletin responds to inquiries from NERC registered Purchasing-Selling Entities and Load Serving Entities¹ doing business within the Transmission Operator Area of the California ISO (ISO) regarding their obligation to arrange for reactive resources pursuant to Requirement 5 of NERC Reliability Standard VAR-001-2, entitled Voltage and Reactive Control. The ISO has no authority over the interpretation and enforcement of mandatory reliability standards under section 215 of the Federal Power Act, 16 U.S.C § 824o. Purchasing-Selling Entities and Load Serving Entities must independently assess and determine their own measures to comply with VAR-001-2 without reliance on this technical bulletin. This technical bulletin is provided for the sole purpose of providing information relevant to that assessment by describing the means the ISO, as a Transmission Operator,² acquires sufficient reactive power resources to protect voltage levels as prescribed by Requirement 2 of VAR-001-2.

Requirement 5 of NERC Reliability Standard VAR-001-2 provides:

Each Purchasing-Selling Entity and Load Serving Entity shall arrange for (self-provide or purchase) reactive resources – which may include, but is not limited to, reactive generation scheduling; transmission line and reactive resource switching; and controllable load – to satisfy its reactive requirements identified by its Transmission Service Provider.

The foregoing language suggests that the ISO, as the Transmission Service Provider, assigns or identifies reactive power requirements for individual Purchasing-Selling Entities and Load Serving Entities. The ISO does not, however, explicitly apportion or allocate system reactive power needs to individual Purchasing-Selling Entities or Load Serving Entities. Nor does the ISO otherwise impose on individual Purchasing-Selling Entities or Load Serving Entities a requirement to directly arrange, either through self-provision or purchase, reactive resources sufficient to ensure the ISO can protect voltage levels under normal and contingency conditions. As discussed further below,

¹ Capitalized terms have the meaning set forth in the NERC Glossary of Terms at http://www.nerc.com/files/Glossary_of_Terms_2011Mar15.pdf, unless otherwise indicated.

² A Transmission Operator may also acquire reactive resources (i.e., other than from generator-based reactive resources) through transmission line and reactive resource switching.

individual Purchasing-Selling Entities and Load Serving Entities facilitate the ISO's acquisition of reactive resources only indirectly through compliance with resource adequacy requirements and ISO market settlement obligations.

The ISO acquires sufficient reactive power by imposing on all Participating Generators,³ other than those resources that use asynchronous technologies or have obtained an explicit exemption, the obligation to maintain a specified voltage schedule. (ISO Tariff Section 8.2.3.3) As such, all non-exempt Participating Generators committed and dispatched through ISO day-ahead and real-time market processes contribute to voltage support by providing reactive power in conjunction with following their awarded schedule or dispatch instructions. Where the ISO requires additional voltage support, it may augment market outcomes by committing resources for reactive power capability through the use of a reliability must-run contract or an Exceptional Dispatch Instruction.⁴ (ISO Tariff Sections 8.2.3.3 and 34.9 *et seq.*) A reliability must-run contract is defined as a service agreement between the "owner of a Reliability Must-Run Unit and the ISO." Although the ISO's authority to pursue a reliability must-run contract is much broader, the ISO may enter into a Reliability Must-Run contract with a Participating Generator as needed for voltage support required to meet local reliability needs. (ISO Tariff Section 41.1) The ISO is more likely to consider the use of a reliability must-run arrangement for voltage support under circumstances where a local voltage condition has been identified by technical analysis and insufficient local resources to supply the necessary voltage support have been designated resource adequacy resources, as discussed further below.⁵ The ISO may also obtain additional voltage support by instructing a Participating Generator to provide reactive power beyond its standard reactive power obligation. (ISO Tariff Section 8.3.8) Except where a Participating Generator is asked to operate outside its specified reactive power range or has received a reliability must-run contract, Participating Generators are not compensated for providing reactive power. (ISO Tariff Section 8.2.3.3)

Load Serving Entities contribute to the ability of the ISO to acquire sufficient reactive power resources under the foregoing ISO Tariff authority in two indirect ways. First, all Load Serving Entities within the ISO Balancing Authority Area have a resource adequacy obligation. (Public Utilities Code §§ 380 [investor owned utilities] and 9620 [local publicly owned utilities]; ISO Tariff Section 40 *et seq.*) This obligation, imposed in the first instance through provisions of state law, requires entities serving end-use

³ Participating Generator is a "Generator or other seller of Energy or Ancillary Services through a Scheduling Coordinator over the CAISO Controlled Grid from a Generating Unit with a rated capacity of 1 MW or greater, or from a Generating Unit providing Ancillary Services and/or submitting Energy Bids through an aggregation arrangement approved by the CAISO, which has undertaken to be bound by the terms of the CAISO Tariff, in the case of a Generator through a Participating Generator Agreement." (ISO Tariff, Appendix A)

⁴ An Exceptional Dispatch Instruction is an instruction to a generator to accomplish an Exceptional Dispatch under ISO Tariff Section 34.9. As a general matter, an Exceptional Dispatch is an instruction to a generator outside the ISO's automated market processes to address specified circumstances set forth in the ISO Tariff.

⁵ A reliability must-run contract is initiated or "arranged" by the ISO. Moreover, the cost of a reliability must-run contract is assigned to the applicable participating transmission owner, not to load serving entities. (ISO Tariff Section 41.7)

customers to contract with eligible supply to cover their monthly peak demand and an additional planning reserve margin that is intended to account for forecast error, forced outages, and operating reserves. This supply, in turn, has an obligation to make itself available to the ISO for commitment and dispatch through its market processes.⁶ Thus, this pool of resource adequacy resources provide the ISO with reactive power by maintaining voltage schedules required as part of those resources general market commitment and dispatch or as otherwise required by the ISO through Exceptional Dispatch. Second, to the extent the ISO instructs a Participating Generator to provide voltage support by operating outside its specified reactive power range, the compensation paid to generators will be allocated under the ISO Tariff to Scheduling Coordinators based on their applicable measured demand. (ISO Tariff Section 11.10.7)

Under the NERC Functional Model, Purchasing-Selling Entities purchase or sell, and take title to, energy, capacity, and reliability related services.⁷ As part of these responsibilities, the NERC Functional Model notes that such entities, among other things, arrange for reliability related services with Generator Owners or Load-Serving Entities. However, under the ISO business model, registered Scheduling Coordinators, which may or may not be Purchasing-Selling Entities, interface with Generator Owners and Generator Operators to provide the reactive power resources through communication of market commitments and dispatches, Exceptional Dispatches or reliability must-run commitments and dispatches. Further, as noted above, the ISO assigns the obligation to maintain the voltage schedule to the Participating Generator, *i.e.*, the Generation Owner or Generation Operator.

Based on the foregoing, the ISO does not explicitly apportion or allocate system reactive power needs to individual Purchasing-Selling Entities or Load Serving Entities. The ISO also does not impose on individual Purchasing-Selling Entities or Load Serving Entities a requirement to directly arrange, either through self-provision or purchase, reactive resources sufficient to ensure that the ISO can protect voltage levels under normal and contingency conditions. Rather, Purchasing-Selling Entities and Load Serving Entities facilitate the ISO's acquisition of reactive resources only indirectly through compliance with resource adequacy requirements and/or paying for the costs of any reactive power acquired by the ISO through in accordance with ISO market settlement obligations.

⁶ Certain resources classified as "use-limited resources" do not have an obligation to bid or schedule into the ISO markets.

⁷ See NERC Reliability Functional Model – Version 5 at http://www.nerc.com/files/Functional_Model>V5>Final_2009Dec1.pdf.