

Compliance Application Notice — 0022

Compliance Application: VAR-002-1.1b R1 and R3

Generator Operation in Manual Mode During Start-Up

Posted [DATE]

Primary Interest Groups

NERC

Regional Entities

Generator Operators

Generator Owners

Issue: Generator Operation in Manual Mode during Start-Up

NERC received requests for clarification regarding whether a generator may be operated in manual mode during start-up.

Reliability Objective

The reliability objective is to ensure generators provide the reactive and voltage control necessary to ensure that voltage levels, reactive flows and reactive resources are maintained within applicable Facility Ratings to protect equipment and the reliable operation of the Interconnection.

Background

Although the standard requires that each generator connected to the interconnected transmission system be operated in the automatic voltage control mode (automatic voltage regulator in service and controlling voltage), some generators are more responsive to control system changes at low load (i.e. during start-up) in the MVAR control mode.

Compliance Application

VAR-002-1.1b R1 and VAR-001-1¹ R4 provide direction on operating in automatic voltage control mode:

VAR-002-1.1b R1. The Generator Operator shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode (automatic voltage regulator in service and controlling voltage) unless the Generator Operator has notified the Transmission Operator.

*VAR-001-1 R4. ...The Transmission Operator shall provide the voltage or Reactive Power schedule to the associated Generator Operator and **direct the Generator Operator to comply with the***

¹ VAR-001-2 was approved by the NERC Board of Trustees on October 5, 2010. It was approved by FERC on January 10, 2011 and will become effective on October 1, 2011. There were no changes to R4 in version 2.

schedule in automatic voltage control mode (AVR in service and controlling voltage). [Emphasis added]

Therefore, while a registered entity has been directed to, and is expected to, operate in automatic voltage control mode, a registered entity may operate a generator in manual mode (MVAR control mode) or any mode other than automatic, for a specific duration of time, i.e. during start-up *provided it has notified its Transmission Operator,* and provided it is able to comply with the voltage or Reactive Power schedule while not operating in automatic voltage control mode.

At the Transmission Operator's sole discretion, a registered entity may notify the Transmission Operator in advance of specific instances (such as start up and shut down) that it will operate its generator in a mode other than automatic voltage control mode.

In the event that a registered entity does not notify its Transmission Operator in advance of operating its generator in a mode other than automatic voltage control mode, it must, pursuant to VAR-002-1.1b R3,² notify its Transmission Operator of the change as soon as possible, but within 30 minutes of the change.

As stated in VAR-002-1.1b R3, a registered entity must notify the Transmission Operator every time it makes a change—i.e. the Generator Operator must notify the Transmission Operator when the generator is taken out of automatic voltage control mode AND the Generator Operator must notify the Transmission Operator when the generator is returned to automatic voltage control mode.

VAR-001-1 R4 and VAR-002-1.1b R2 provide direction on maintaining the voltage and Reactive Power schedule:

VAR-001-1 R4. Each Transmission Operator shall specify a voltage or Reactive Power schedule¹ at the interconnection between the generator facility and the Transmission Owner's facilities to be maintained by each generator. The Transmission Operator shall provide the voltage or Reactive Power schedule to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode (AVR in service and controlling voltage). [Emphasis added]

¹ *The voltage schedule is a target voltage to be maintained within a tolerance band during a specified period.*

² VAR-002-1.1b R3 provides: Each Generator Operator shall notify its associated Transmission Operator as soon as practical, but within 30 minutes of any of the following:

R3.1. A status or capability change on any generator Reactive Power resource, including the status of each automatic voltage regulator and power system stabilizer and the expected duration of the change in status or capability.

R3.2. A status or capability change on any other Reactive Power resources under the Generator Operator's control and the expected duration of the change in status or capability.

*VAR-002-1.1b R2. Unless **exempted** by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power output (within applicable Facility Ratings¹) as directed by the Transmission Operator. [Emphasis added]*

¹ *When a Generator is operating in manual control, reactive power capability may change based on stability considerations and this will lead to a change in the associated Facility Ratings.*

Therefore, a registered entity must comply with the voltage or Reactive Power schedule, regardless of whether the registered entity is operating in automatic voltage control mode or manual mode (MVAR control mode), unless exempted by the Transmission Operator.

Effective Period for CAN

This CAN is effective upon posting on the NERC web site and will remain in effect until such time that a future version of the standard or an interpretation addresses this specific issue and is enforceable.

Providing Evidence of Compliance

A registered entity must be able to provide evidence to its compliance enforcement authority/auditor of:

1. its notifications to its Transmission Operator that it would not be operating in automatic voltage control mode for any time period that it was not; and
2. its notifications to its Transmission Operator of any change in status or capability; and
3. its compliance with the voltage and Reactive Power schedule during any period of time it was not operating in automatic voltage control mode.

For more information please contact:

Michael Moon
Director of Compliance Operations
Michael.moon@nerc.net
404-446-2567

Valerie Agnew
Manager of Compliance Standards Interface and Outreach
Valerie.agnew@nerc.net
404-446-2566

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