

Compliance Application Notice – 0022

VAR-002 R1 and R3 Generator AVR Operation in Alternative Mode¹

Posted: June 17, 2011

Revised: December 9, 2011

Primary Interest Groups

Compliance Enforcement Authority (CEA)²

NERC

Regional Entity

Generator Operator (GOP)

Issue: May a generator's Automatic Voltage Regulator (AVR) be operated in a control mode other than automatic mode at any time – including start-up or shut-down – under VAR-002?

For the purpose of aiding a CEA, this CAN provides guidance regarding the operation of generators' AVRs in a mode other than automatic, at any time the generator is connected to the interconnected transmission system, to ensure that voltage levels, reactive flows and reactive resources are maintained within applicable Facility Ratings.

Compliance Application

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

VAR-002-1.1b³ 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-001-2 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 schedule in automatic voltage control mode** (AVR in service and controlling voltage). [Emphasis added]*

CEAs are instructed to verify that a registered entity operated its generators' AVRs in automatic voltage control mode at any time the generator was connected to the interconnected transmission system unless the registered entity **notified its TOP**, in which case the registered entity may have operated a

¹ This CAN does not provide guidance for VAR-002-WECC-1. CEAs are to continue to verify that registered entities subject to VAR-002-WECC-1 meet the requirements of that standard.

² Compliance Enforcement Authorities include ERO auditors, investigators, enforcement personnel or any person authorized to assess issues of concern, potential non-compliance, and possible, alleged or confirmed violations of NERC Reliability Standard and requirements.

³ The version of the standard is included here to provide citation for the quote of the requirement.

generator's AVR in manual mode or any mode other than automatic, ***provided*** its obligation in regard to voltage or Reactive Power⁴ was met, because the entity either:

1. had been exempted from complying with the voltage or Reactive Power schedule pursuant to R2⁵ by the TOP; or
2. complied with the voltage or Reactive Power schedule while not operating in automatic voltage control mode; and, pursuant to R2.2,⁶ if the entity had been directed to modify voltage, it either complied with the direction or gave the applicable TOP an explanation of why the schedule could not be met.

Advance Notification: In the event that a registered entity did not notify its TOP in every instance that it operated in a mode other than automatic, CEAs are to verify whether a registered entity opted to provide a blanket notification to its TOP regarding when it would be operating in a mode other than automatic voltage control mode. For example, a blanket notification could refer to the appropriate times during: 1) generator testing, 2) generator start-up, and 3) generator shut-down. If the registered entity acted on this option, the CEA is to verify that the registered entity's TOP received the blanket notification in lieu of separate notifications for each change in status.

No Advance Notification: CEAs are to determine whether, in the event that a registered entity did not notify its TOP in advance of operating its generator's AVR in a mode other than automatic voltage control mode, the registered entity, pursuant to VAR-002 R3,⁷ notified its TOP as soon as was practical, but within 30 minutes of the change.

⁴ VAR-001-2 R4 and VAR-002-1.1b R2 also provide direction on maintaining the voltage and Reactive Power schedule:

VAR-001-2 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.*

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.*

⁵ VAR-002-1.1b R2 provides: Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power output (within applicable Facility Ratings) as directed by the Transmission Operator.

⁶ VAR-002-1.1b R2 provides: When directed to modify voltage, the Generator Operator shall comply or provide an explanation of why the schedule cannot be met.

⁷ 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 R3.1 and R3.2 also require a registered entity to notify its associated TOP of the expected duration of the change in status or capability, which may be unknown at the time the registered entity notifies the associated TOP of the status or capability change. A CEA is to verify that the registered entity provided the duration information that was known at the time the registered entity notified its associated TOP of the status or capability change and that the registered entity followed up with subsequent notifications to its associated TOP as additional duration information became known.

Notification for every change: Per VAR-002 R3, CEAs are to determine whether a registered entity notified the TOP every time it made a change (except in the case of providing advance notice)—*i.e.*, whether the GOP notified the TOP when the generator was taken out of automatic voltage control mode, **and** whether the GOP notified the TOP when the generator was returned to automatic voltage control mode.

Effective Period for CAN

This revised CAN supersedes the original CAN, as well as all prior communications. CEAs are to use this CAN to assess compliance from June 17, 2011, regardless of the start date of the violation. It will remain in effect until such time that a future version of a FERC or other applicable government authority approved standard or interpretation becomes effective and addresses the specific issue contained in this CAN.

For any enforcement action in process and for audits that have been initiated,⁸ a CEA will apply the appropriate discretion, including consideration of the specific facts and circumstances of the non-compliance, in determining whether to assess compliance pursuant to this CAN.

Evidence of Compliance

CEAs are to assess the following to attain reasonable assurance of the entity's compliance:

1. evidence of a registered entity's advance notifications to its TOP that it would not be operating in automatic voltage control mode, either for every individual instance or by blanket notification, and evidence the TOP received the notifications. A CEA is to verify that the registered entity provided notification when the generator's AVR went out of automatic control mode and also provided notification when the generator's AVR returned to automatic control mode; and
2. in the event a registered entity did not provide advance notification, a registered entity's notifications to its TOP of every change in status or capability within 30 minutes of the change, including when the generator's AVR went out of automatic control mode and also when the generator's AVR returned to automatic control mode; and

⁸ "Initiated" means that a registered entity has received notification of the upcoming audit.

3. a registered entity’s compliance with the voltage and Reactive Power schedule whenever it was not operating in automatic voltage control mode by one of the following:
 - a. evidence the entity had been exempted from complying with the voltage or Reactive Power schedule pursuant to R2 by the TOP; or
 - b. evidence the entity complied with the voltage or Reactive Power schedule while not operating in automatic voltage control mode; and, if the entity had been directed to modify voltage, pursuant to R2.2, evidence that it either 1) complied with the direction or 2) gave the applicable TOP an explanation of why the schedule could not be met.

For more information please contact:

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

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

This document is designed to convey compliance monitoring instruction to achieve a measure of consistency among auditors and Compliance Enforcement Authorities. It is not intended to establish new requirements under NERC’s Reliability Standards or to modify the requirements in any existing NERC Reliability Standard. Compliance will continue to be assessed based on language in the currently enforceable NERC Reliability Standards. This document is not intended to define the exclusive method an entity must use to comply with a particular standard or requirement, or foreclose a registered entity’s demonstration by alternative means that it has complied with the language and intent of the standard or requirement, taking into account the facts and circumstances of a particular registered entity. Implementation of information in this document is not a substitute for compliance with requirements in NERC’s Reliability Standards.

Revision History

Posted Date	Action	Revision
June 17, 2011	Posted Final CAN	
December 9, 2011	Posted Revised CAN	Revised target audience to CEAs