

Lesson Learned

Control Labeling of Generator Voltage Regulators

Primary Interest Groups

Generator Operators (GOPs)

Generator Owners (GOs)

Problem Statement

A GOP discovered that a certain manufacturer's generator automatic voltage regulators (AVRs) were continuously operating in a constant reactive power output control mode instead of automatic voltage control mode (as desired) due to confusing control system labeling.

Details

During a routine review of standard operating procedures, the GOP noticed the voltage regulator on a generator appeared to be operating in a constant reactive power output mode (labeled "VAR" on the AVR control system) instead of automatic voltage control mode. Subsequently, the GOP confirmed that other entities with the same control system were operating in the same manner.

After further review, the GOP determined the labeling of the control modes was confusing on the AVR mode control screen. The voltage control screen had only three modes of control: "OFF," "PF" (i.e., constant power factor), or "VAR" (i.e., constant reactive power output). During commissioning, technicians were trained by the manufacturer to operate in "VAR" mode. The technicians understood this to mean the units were operating in automatic voltage control when in "VAR" mode.

As a follow-up to these concerns, the entity checked with the manufacturer and learned that in order to have the voltage regulator operate in automatic voltage control mode, the voltage control screen should be set to the position labeled "OFF."

Corrective Actions

The entity removed "OFF" from the control panel and replaced it with "Voltage Control" to avoid confusion. The entity, in concert with the manufacturer, verified the units were operating in the automatic voltage control mode when that function is selected on the control panel. Further, the manufacturer issued a technical information letter describing the corrective actions to be taken.

Lesson Learned

GOPs and GOs should review all manufacturers' technical information letters and verify the generator control systems are set in the correct mode for automatic voltage control operation. Generator equipment should be checked to make sure it is operating in the automatic voltage control mode. Incorrect labeling should be corrected as soon as possible. These generating units shall not be operated in other control modes (e.g., constant power factor control) unless authorized to do so by the host Balancing Area or Transmission Operator. The control mode of generating units shall be accurately represented in operating

studies. Training for GOP and GO staff should clearly explain the meaning of each control mode as labeled on the voltage control screen. All user manuals and operator procedures should be modified to accurately describe the different modes and correct labeling.

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