GE Energy's Integrated Volt-VAR Control (IVVC) allows you control over your actions helping you achieve your operating objectives: optimized network reliability with significant economic savings.

Why choose IVVC?
IVVC is the application of choice for utilities looking to leverage their investment in a DMS system through optimized power distribution. It is a building block of any Smart Grid solution. IVVC achieves the optimal economic benefits via co-ordinated control of voltage and reactive power. Utilities switch on capacitors in order to keep the number of VARs to a minimum. However, switching capacitors on increases the voltage. IVVC gives utilities the advantage of being able to simultaneously evaluate and recommend controlling capacitor banks and transformer taps concurrently. Optimal economic benefits are achieved by meeting several priorities and objectives, such as relieving violations, shaving peak loads, and reducing power losses through voltage reduction.

Application objectives
IVVC provides the following:

- Demand Minimization, which helps shave off the load peaks during periods of high demand. This minimization can be achieved via voltage reduction to minimum values without violating equipment operating limits and other constraints set by the user. This objective enables utilities meet their critical needs during high-demand conditions with their existing resources.
Violation Reduction, which ensures that no unnecessary overloading conditions exist in the network. Overloading conditions can lead to avoidable increased costs resulting from equipment failure or equipment having a shortened life span.

User-defined constraints
IVVC makes full use of the underlying DMS device modelling and connectivity information through its analysis and recommendation process. The IVVC objective is reached after taking into account a number of factors that the users set. Such factors, identified as penalties in the objective calculation, include:

- Flow Violation Penalty
- Voltage Violation Penalty
- Peak Load Violation Penalty
- Power Factor Violation Penalty

It is up to the utility to prioritize the penalties depending on the cost benefit weight of each one. The weight of each penalty is definable by the user.

Realized energy savings
Advanced algorithms handle Demand Minimization by reducing the voltage in the network without going beyond the equipment specified limits. Independent studies have shown that a three percent voltage drop results in an average of two percent energy savings! Voltage reduction can be achieved either by changing the transformer taps, or by controlling capacitor banks which causes a correction in the Power Factor value. IVVC makes recommendations on manipulating transformer taps and on capacitor bank switching in order to achieve its goals. IVVC can be configured to automatically implement these recommendations via SCADA controls.

IVVC can be tuned according to your objectives.
In addition, IVVC can be used to alleviate voltage limit violations. These violations can have a negative effect on the operation of equipment, which is always associated with a cost. IVVC is capable of predicting and displaying the estimated reduction in violations prior to carrying out the actual recommendations.

Two levels of control are offered by IVVC: substation and feeder level controls. The user can choose to enable feeder and/or substation devices to be considered when analyzing the network and recommending a set of optimizing actions.

IVVC offers significant increased revenue through cost savings by minimizing losses, correcting violation, and reducing VAR flows. With controllable transformer taps and switchable capacitor banks, a utility is easily able to deploy IVVC and begin reaping the economic benefits. As demand for power rises at a sharper rate than supply, IVVC becomes a necessity to optimize distribution of power in the network.

Contact us to find out how you can benefit from the innovative IVVC application.

Limit violation pre- and post-recommendation implementation.