OVERVIEW

VDS fully supports the dispatch of reactive plants and resources. It can improve how voltage control is performed and has been greatly appreciated by transmission operators to help with the retirement of experienced operators. Operators can decide if VDS will be used as an advisory tool, or if it will fully automate the voltage control actions.

VDS was designed considering the following objectives:

• Maintain base case and post-contingency voltage within voltage ratings
• Improve Security
• Improve Equipment Life
• Improve VAr allocation

BUSINESS CHALLENGE

Many countries are quickly introducing renewables and distributed energy resources in their generation profile in order to achieve a zero-carbon grid.

The adoption of these energy sources have already impacted grids by greatly increasing load variation during the day and creating large variations in inter-regional flows. Also, large variations in temperature across different geographic regions can lead to significant variations in demand.

As a result, the number of voltage control actions in the control room is increasing fast. In some cases, transmission operators have fully dedicated operators only to perform voltage control operation.

REAL RESULTS

Grid Size

- No. of Buses: ~2,500 SCADA
- Generating units: ~360
- Installed capacity: ~42,000 MW
- High renewables penetration

Outcome

- 99.9% convergence rate, with all violations resolved 99% of the times
- ~350 voltage instructions per day managed more proactively
- Operators freed up to perform more complex operational tasks

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