

## First pilot project of STATCOM plus Supercapacitor - Grid-Forming

Currently there is no STATCOM plus Supercapacitor system for bulk power systems in operation around the world. However, during the last years high development effort was spent on this solution and finally Siemens Energy got an award to execute the first turnkey pilot project worldwide.

The system is rated to  $+300\text{MVAr}$  and the storage is designed to 200MWs. The controller features a grid forming control with immediate response in case of voltage disturbance and grid-frequency excursions.

Specific protection functions for the Supercapacitor System were determined and verified by protection studies and implemented in the STATCOM control system, which generates the applicable alarm signals and functions.

The functional performance of control and protection systems will be verified through Electromagnetic Transient (EMT) simulation and Hardware in the Loop (HIL) tests.

The system design, and the applicable insulation coordination requirements is based on the relevant IEC standards for high-voltage applications and long-term experience in STATCOM and HVDC applications.

Together with the sub-suppliers and partners, Siemens Energy gained practical experience, performed many simulations, executed development, and proved the functionality and performance of the Supercapacitor system by several type tests. Together with the established design of the converter equipment Siemens Energy get high confidence on the performance and reliability of the STATCOM installation.