CALL FOR PAPERS
Journal of Modern Power Systems and Clean Energy

Special Section on Control Centers for the Evolving Power Grid: Architecture and Applications

The world-wide push to move the electric power supply from its dependence on fossil fuels, as a part of decarbonizing the global economy, is rapidly transforming the architecture of the electric power grid. The large central generating stations connected to the transmission network are being replaced with smaller, numerous, non-synchronous, distributed generation sources often connected to the lower voltage distribution network. These 'edge' devices also includes active (dispatchable) loads that are sometimes on the customer side of the meter. This change of the distribution system from a passive system to a much more controllable part of the grid is also necessary to increase the resiliency of the grid against more frequent severe weather disturbances as a result of climate change. Increasing resiliency, which is also needed to withstand the threat of cybersecurity, means that in addition to the energy architecture of the grid, the ICT architecture of the grid, consisting of monitoring, communication, computation and control, is also changing rapidly.

The large interconnected grids of today, some of which span significant portions of continents, are monitored and controlled, both automatically and by human operators, through a hierarchy of local controls and control centers. The focus of this Call for Papers for a Special Section is the Control Center, which is also rapidly evolving to cope with the evolving architecture of the power grid both in the energy and the ICT portions. The Energy Management Systems (EMS) that are responsible for the economic and reliable operation of the bulk power system have new monitoring technologies like phasor measurements (PMU) that can support better applications but at the same time losing direct control of energy resources that are increasing on the distribution network. On the other hand the distribution control centers (DMS) are now proliferating to monitor and control the DER which are increasing. In addition to the increasing number of DMS, new applications for the DMS are being designed to handle all the new technologies at the edge of the system.

The main objective of this special section is to document the present state of the art in control centers and the direction its evolution is taking. We understand that the evolution of the power grid will not be the same all over the world and will certainly not occur at the same rate. Similarly, the evolution of the control centers in the different parts of the world may be different depending on standard setting bodies and vendor innovation. We are seeking documentation of such evolution and are willing to publish the different advances as long as they meet the publication standards of this journal.

The topics of interest include, but are not limited to:

- Overview papers that document the evolution of EMS and DMS architectures, recognizing that the DMS architectures are in flux and rapidly evolving.
- There has been some attempts to coordinate the architectural development of EMS and DMS – not just the EMS-DMS (or TSO-DSO) data exchange – but also coordinated computer communications, data management, user interfaces, etc.
- New applications both for EMS and DMS, as well as applications that may span both transmission and distribution systems.
- New applications that use data science and machine learning techniques to enhance operator and control center effectiveness.

- The monitoring, communication and control applications of edge devices are of particular interest especially including power electronics controls and storage devices.
- Monitoring and control for active energy resources on the customer side of the meter is of interest (markets and market design are not of interest for this CfP).
- Monitoring, communication, computation and control of Virtual Power Plants (VPP)

Submission Guidelines

The manuscripts should be submitted at https://mc03.manuscriptcentral.com/mpce.
The article templates can be downloaded from
http://www.mpce.info/ch/reader/view_news.aspx?id=20150519040134001.

Important Dates

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