CALL FOR PAPERS
Journal of Modern Power Systems and Clean Energy

Special Section on Protection and Control of Smart Grid with High Penetration of Converter Interfaced Generation Resources

Electrical system characteristics are changing substantially as the penetration levels of renewable generation and in general converter interfaced generation resources (CIGRs) increase. We have predictions that some systems may even go all the way to 100% penetration of CIGRs. As a result, changes of system characteristics occur across the board affecting transmission and distribution systems. On the other hand, legacy protection and control systems have evolved to a high degree of sophistication. However, these legacy protection and control systems face new challenges especially at the transmission and distribution levels as CIGRs alter the dynamics and the characteristics of the power grid at both transmission and distribution. Most dramatically, legacy protection and control systems at the distribution level are designed assuming unidirectional flow; distributed resources upset this behaviour compounded with the unique characteristics of CIGRs, such as lack of negative/zero sequence fault components, limited fault currents, unusual dynamics of the fault evolution, etc. Additionally, the complex converter controls of CIGRs further complicate matters. Therefore, the need exists for identifying limitations of legacy protection systems and the developmenmt of new protection and control approaches that will be compatible with the realities of the new systems.

Recent major outages in power systems with high share of CIGRs illustrate dynamic security vulnerabilities due to synchronization instability of inverters, lower inertia, lower network strength, and new fault characteristics of the system, among others. Some real-world examples of such events are as follows: (a) FirstSolar's 550 MW utility-scale PV plant experienced 7 Hz power and voltage oscillations subsequent to outage of some lines, leading to lower system strength. (b) September 28, 2016 South Australia blackout reveals that under frequency load shedding (UFLS) relays contributed to the outages as the result of low inertia of the system. (c) On August 16, 2016, a fault induced a total of 1178 MW of PV power interruption in Southern California.

We invite contributions on all matters related to the protection and control systems for smart grid with high penetration levels of CIGRs.

Contributors are invited to present papers in the following fields:

- Operation of renewables
- Inverter technologies and impact on protection and control
- Root causes of protection system vulnerabilities and mis-operations
- Impact of power system transients on CIGR protection and control systems
- Handling of power systems including renewable generation
- Protection approaches that mitigate the effects of CIGRs
- Adaptive protection approaches to address CIGR challenges
- New protection and fault location approaches immune to system characteristics with high penetration of CIGRs
- How inverters affect the operation of electrical systems with renewable facilities
- Advanced inverter control designs to strengthen CIGRs against system disturbances
- Impacts of active power distribution systems dynamics on transmission systems

- Protection and control of CIGRs dominated microgrids
- Impacts of external system dynamics on inverter protection and control
- Impact of inverter system characteristics on power grid protection and control
- Country norms and standards addressing above issues
- Other related issues

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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