CALL FOR PAPERS
IEEE TRANSACTIONS ON POWER DELIVERY
Special Issue on “Modern Substation Technologies”

The reduction of available space and the high price of the real estate in urban and residential areas make the building of new substation facilities difficult and costly. The public at-large may consider the building of a new substation as visual pollution. These objections in large cities and towns resulted in the building of Gas Insulated Substations (GIS) in high rise buildings. In residential areas the combination of GIS and traditional techniques have been proposed. Circuit breaker, current transformer and disconnect switches are integrated in a GIS unit and placed outdoor between the substation bus bar and the transformer. Manufacturers claim that this reduces the substation footprint substantially.

In North America the traditional breaker-and-a-half configuration is often used Outside North America double bus bar with two disconnect switches and a circuit breaker is often used. This calls investigation of substation configuration.

The advancement of direct digital control results in the update of SCADA data and increased use of remote control of the system including the incorporation of PMUs in the substation control. The direct computer control may be a security concern. As an example, hackers may disrupt the substation controls. These issues call for investigation and technical papers on substation security as indicated below.

Advancing the state of art in substation modernization

1. Novel connection configuration for higher reliability and reduced cost
2. Combination of outdoor and GIS technologies for substation area reduction
3. Cost reduction of GIS system by optimized configurations
4. Interconnection of the outdoor GIS units with the existing system
5. Feasibility of outdoor hidden GIS applications
6. Replacement of SF6 with environmentally friendly insulating gas
7. Evaluation of grounding grid efficiency (e.g., lightning caused flashover of renewable insulation)
8. Improved substation lightning protection and reduction of lightning caused outages
9. Reduction of short circuit caused step potential at the edges of the substation grounding grid
10. Optimal location of substation fences to protect the nearby public walking
11. Gas insulated transmission lines for high power transmission
12. DC compact systems for switching and transmission
13. Substation security with GIS indoor
14. Non-conventional instrument transformers integrated into GIS

Application of advanced computer communication & control for substations

1. SCADA system security assessment and development of a system with higher reliability
2. Integration of PMU system with the existing SCADA system
3. Study of substation security and assessment of hacker penetration
4. Application of novel sensors (e.g., heat sensors) for detection of future equipment failures
5. Evolving communication technology deployed to interconnect various substations components
6. Solid State Transformer. Is this a future device on the substation?
7. Area control of FACT devices
8. Fault current Limiters for reduction short circuit current produced damage
9. Substations with energy storage devices
10. Gas insulated substations in storm hardening and physical security

Reduction of Environmental effect of Substations

1. Reduction of magnetic and electric fields
2. Reduction of visual impact of substations by surrounding the substation with vegetation
3. Guidelines for determination of optimal location of a substation.
4. Non-conventional instrument transformers integrated into GIS
5. Reduce visual impact of substations
6. Reduce oil contamination potential
7. Compact substation design to limit environmental impact

**Control**
1. Digital substation control
2. Non-conventional instrument transformers for substations control

**Submission Guidelines**
This special issue solicits original work that must not be under consideration for publication in other venues. Two-page extended abstracts are solicited for the first round of reviews. Authors of selected abstracts will be invited to submit the full papers in the second round. The format of extended abstract is the same as the Power Engineering Letter (PESL). The extended abstract shall be submitted through PWRD’s manuscript central website, i.e. [https://mc.manuscriptcentral.com/pwrd-pes](https://mc.manuscriptcentral.com/pwrd-pes). When submitting, please select the manuscript type as “Special Issue: Modern Substation Technologies (Abstract Submission)”. This manuscript type will be open for abstract submission on or before July 1. More information can be found from PWRD resource site [http://sites.ieee.org/tpwrd/](http://sites.ieee.org/tpwrd/) or by contacting Guest editor-in-Chief George Karady (karady@asu.edu).

**Important dates**
- August 31, 2015: Deadline for extended abstract submission
- October 31, 2015: Authors receive decision letters
- January 31, 2016: Deadline for submission of full papers
- May 30, 2016: Notification of final decisions
- June 30, 2016: Publication material due

**Guest Editorial Board**

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