

Studienkomitee C4

System Technical Performance

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CIGRE 2014 Paris Session

- „Technical Session“ des Studienkomitees C4 am Dienstag den 26. August 2014
- Vorsitz: Pouyan Pourbeik (Chairman C4)
- Special Reporter: Dalton O C Brasil, Stephan Pack, Richard McCurrach

- PS1: Power system technical performance in the advent of large deployment of power converter connected generation technologies
- PS2: Methods and techniques for the evaluation of lightning performance and insulation coordination
- PS3: Advanced methods, models and tools for the analysis of power system technical performance

- 32 wissenschaftliche Beiträge, zahlreiche Diskussionsbeiträge und spontane Wortmeldungen
- über 400 Teilnehmer
- Poster Session

PS1: Power system technical performance in the advent of large deployment of power converter connected generation technologies

- Impact on stability and reliability of the power system due to large amounts of inverter based wind and solar PV generation, and large amounts of HVDC (wind plants and interconnectors)
- Impact of wind, solar-PV and tidal generation on power quality
- EMC and power quality impact of large scale voltage source converter (VSC) based technologies

Summary:

- Power quality (PQ) in power systems is based on wind and photovoltaic (PV) generation. Continued research and development is needed
- Wind generation has been demonstrated to be capable of providing primary frequency response and emulated inertial response
- Development of generic models for wind generation, for both stability and electromagnetic transient (EMT) studies
- Development of tools and techniques for the analysis of system technical performance related to HVDC deployment such as assessing EMC, harmonics etc.

PS2: Methods and techniques for the evaluation of lightning performance and insulation coordination

- Evaluation of lightning performance and models (e.g. leader-progression versus EGM) for EHV and UHV AC and DC lines
- Protection of other exposed structures such as wind turbines
- Insulation coordination for EHV and UHV AC systems including adequate modelling of apparatus

Summary:

- The evaluation of the lightning performance of transmission lines is important in terms of the rational lightning protection and insulation designs of power systems
- On-site measurements of the transient current distribution on transmission lines as well the collection of transient voltages in system nodes can provide good quality data for calculation methods
- Insulation coordination concerning GIS and transformers as well as activities on reduction of insulation levels in power systems (Japan: a new lightning impulse withstand level has been standardized under consideration of implementing a high-performance metal oxide arrester)

PS3: Advanced methods, models and tools for the analysis of power system technical performance

- Application of hybrid tools for 3-phase and positive sequence modelling of power systems, and hybrid EMT and finite-difference time-domain analysis
- Characterization and modelling of geomagnetically induced currents
- Analysis of system performance with a large number of long AC cables, such as the potential for harmonic resonance

Summary:

- Understanding the environment of geomagnetic disturbances and their impact on the power system, much further work is needed to develop the necessary tools and techniques for studying this phenomenon and its impact on the power system
- The application of long AC cables is increasing in many systems (application of multiple AC cables and studies of power flow and TOV concerns)

Komiteearbeit

- Sitzung C4 "System Technical Performance,, Freitag den 29. August 2014
- Vorsitzender Dr. Pouyan Pourbeik (EPRI, USA)
- Sekretär Dr. Eng. Hideki Motoyama (CRIEPI, Japan)
- 38 Mitglieder, 24 Regular Members und 14 Observer Members
- 38 Nationen
- Energieversorgungsunternehmen, Industrie und Forschungseinrichtungen
- 3 Advisory Groups (AGs), technischen und strategischen Inhalte, Kontakte und Koordination zu und mit anderen Studienkomitees und Institutionen (z.B. IEEE, IEC, CIGRE etc.), Organisation von Symposien, Kolloquien, Tutorials oder Workshops
- Derzeit 26 aktiven Arbeitsgruppen (WG)
- Homepage: Website <http://c4.cigre.org>

- CIGRE Technical Committee Award 2014: Dr. Wah Hoon Siew, University of Strathclyde, Scotland, United Kingdom

Veranstaltungsvorschau

- CIGRE International Symposium “Across borders - integrating systems and markets”, Lund, Schweden, Mai 2015
<http://cigre.org/Events/Symposia/Symposia-2015/Lund-Symposium>
<http://www.malmokongressbyra.se/cigre>
- C4 International Colloquium on EMC, Lightning and Power Quality Considerations for Renewable Energy Systems, Curitiba City, Brazil, März 2016
- CIGRE Paris Session, 21.-26. August 2016

Preferential Subjects für CIGRE Paris Session 2016

- PS 1: Impact of inverter based generation and energy storage
- PS 2: Challenges with modelling and evaluation of lightning performance and insulation coordination in the power system of the future
- PS 3: Bridging the gap between EMT, FEM and positive sequence grid simulation