



INTERNATIONAL COUNCIL ON LARGE ELECTRIC SYSTEMS
CONSEIL INTERNATIONAL DES GRANDS RÉSEAUX ÉLECTRIQUES



INTERNATIONAL COLLOQUIUM
Lightning & Power Systems

May 12th – 14th, 2014
Lyon – France

Sponsors of the colloquium



Météorage



Rte



Background & Scope

CIGRE Study Committee C4 on System Technical Performance is pleased to present the international colloquium on 'Lightning and Power Systems' in Lyon, France. The colloquium is organized by the French National Committee of CIGRE with cooperation from SCs A3 (HV Equipment), B1 (Insulated Cables), B2 (Overhead Lines) and B3 (Substations).

The three-day event includes presentation of papers along with a special poster session for students undertaking research. There are also lectures directed towards research students. The colloquium will take place at the INSA of Lyon, an engineering school located in close vicinity of Lyon city centre.

Lyon is considered as one of the most beautiful cities in France, combining harmoniously modernity and tradition, history and European ambitions. Lyon has an international airport and can easily be reached from other countries.

The colloquium is aimed at bringing together CIGRE experts from around the world joined by regional engineers, managers and researchers to facilitate exchange of knowledge, experience and information towards further understanding phenomena associated with lightning and implementation of protective measures against its effect on electric power systems.

Professional engineering societies such as the CIGRE Study Committee C4 play an important role in expanding the knowledge on lightning phenomena and in identifying cost-effective solutions to minimize the impacts of lightning on power systems and thus the electricity consumers. We firmly believe that this colloquium will benefit the power industry in general and therefore would like to encourage participants to share their knowledge and experience in lightning and lightning protection related to electric power systems.

Main Topics

The main topics of the colloquium that are specifically focused on are:

1. The exploitation of data provided by lightning detection systems (LDS), corrections applied to measurements;
2. Principles of lightning detection, limitations and performance of existing systems;
3. Direct measurement of lightning currents using instrumented tall structures;
4. Numerical simulations in lightning-related studies, overvoltage protection;
5. Electrical tower grounding;
6. Improvement of the protection of overhead lines and substation equipment against lightning and other transient phenomena;
7. The protection of underground or submarine cables against lightning;
8. Arresters monitoring, field experience and possible conclusions about arrester condition.

Committee

COLLOQUIUM CHAIRMAN

Alain Xemard (France)

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Bernhard Richter (Switzerland)
Alain Rousseau (France)
Salih Sadovic (France)
George Watt (Canada)
Alain Xemard (France)

Monday, May 12, 2014

Time	Title of Paper / Author(s)
09:00 - 09:15	Welcome Address Alain Xemard (Chairman of the colloquium), Ivo Uglesic (Chairman of the TC), Zia Emin (Co-Chairman of the TC)
09:15 - 09:30	Presentation of the INSA Lyon Eric Maurincomme (Director of the INSA Lyon)
09:30 - 10:00	Opening Address Yves Maugain (Secretary of the CIGRE TC)
10:00 - 10:30	Introduction to the lightning performance of TL and the work of Cigre C4.23
Invited Lecture 1	Chris Engelbrecht
10:30 - 11:00	Coffee break
11:00 - 11:30	Electrical Transient Interaction between Transformers and the Power System: Description of the high frequency aspects raised by the new CIGRE brochure A2/C4-39
Invited Lecture 2	Michel Rioual
11:30 - 12:00	Introduction to lightning detection systems
Invited Lecture 3	Marc Bonnet
12:00 - 12:30	Underground cables, the importance of lightning
Invited Lecture 4	Pierre Argaut
12:30 - 14:00	Lunch Break

Session I – Measurements and their application

Chairman Alain Rousseau

14:00 - 14:20	Real time lightning current measurement in a 63 kV overhead to underground transition
Paper 17	D. Marin, S. Sadovic, T. Sadovic
14:20 - 14:40	Development of an innovative system of remote monitoring of SVL
Paper 15	O. Cohin, D. Dubois
14:40 - 15:00	Transmission line lightning performance monitoring pilot project
Paper 22	A. Xemard, T. Sadovic, S. Sadovic, M. Mesic, D. Marin
15:00 - 15:20	Study of the effect of lightning strikes on MV/LV power transformers reliability using lightning detection systems data
Paper 11	P. Carer, E. Gouno, L. Guerineau
15:20 - 15:40	Electrical tower grounding measurement
Paper 18	D. Guillot
15:40 - 16:00	Coffee Break

Monday, May 12, 2014

Session II – Lightning incidence

Chairman Dr. Alain Xemard

Time	Title of Paper / Author(s)
16:00 - 16:20 Paper 4	Application of lightning location data for designing the external lightning protection system B. Franc, I. Uglesic, B. Filipovic-Grcic
16:20 - 16:40 Paper 12	Lightning strike-point density for risk assessment C. Bouquegneau, A. Rousseau
16:40 - 17:00 Paper 5	Performance validation of the European lightning location system Euclid W. Schulz, D. Poelman, S. Pedeboy, C. Vergeiner, H. Pichler, G. Diendorfer, S. Pack
17:00 - 17:20 Paper 23	Lightning activity monitoring on telecom towers S. Sadovic, T. Sadovic, H.-D. Betz
17:20 - 17:40 Paper 29	An update on the Instrumentation of the Säntis tower in Switzerland for lightning current measurements and obtained results M. Azadifar, M. Paolone, D. Pavanello, F. Rachidi, C. Romero, M. Rubinstein
17:40 - 18:00 Paper 13	Cumulative probability distribution of the stroke angle in lightning incidence to transmission lines A.T. Lobato, M.A.O. Schroeder, D.E. Cruz, R.A.R. Moura, W.S. Sales, L.C. Nascimento, S.C. Assis

20:00-23:00 Diner at «Brasserie Georges»

Tuesday, May 13, 2014

Session III – Protection of distribution systems against lightning

Chairman Prof Salih Sadovic

Time	Title of Paper / Author(s)
08:50 - 09:10 Paper 9	Field experience with MO surge arresters in distribution systems B. Richter
09:10 - 09:30 Paper 14	Lightning surge protection of photovoltaic power plants connected to a distribution network C. Vollet, I. Gal, S. Mathiou, M. Derrien, M. Boukahil
09:30 - 09:50 Paper 34	Improved lightning protection of distribution transformers by filtering bushings W. Piasecki, M. Florkowski, C. Carollo, P. Klys, E. Stryken
09:50 - 10:10 Paper 1	Protection of High-Voltage Motors in a Thermal Power Plant against Over Voltages Y. Nagarjun
10:10 - 10:30 Paper 30	Consideration of TVSS energy consumption in Windmills during lightning strokes M. Martinez-Lozano, L. Diaz-Pulgar
10:30 - 11:00	Coffee break

Session IV – Simulation of lightning surges

Chairman Prof Stephan Pack

11:00 - 11:20 Paper 2	High frequency transformer model for calculations of transferred overvoltages B. Jurisic, A. Xemard, I. Uglesic, F. Paladian
11:20 - 11:40 Paper 7	Effect of uncertainties on the precision of lightning studies A. Xemard, A. Pagnetti, M. Martinez, P.D. Moreau, F. Paladian, P. Bonnet, C.A. Nucci
11:40 - 12:00 Paper 16	Sheath over-voltages in cross-bonded underground transmission lines A. Naud, M. Nguyen-Tuan, W. Frelin
12:00 - 12:20 Paper 24	On the numerical analysis of lightning effect on power installations F. Paladian, P. Bonnet, S. Lallechere, A. Xemard, C. Miry
12:20 - 12:40 Paper 27	Numerical simulations of lightning surges: A practical case study of overvoltage transmission through a HV/MV transformer E. Rutovic
12:40 - 14:00	Lunch Break

Tuesday, May 13, 2014

Session V – Protection of overhead lines

Chairman Prof Ivo Uglesic

Time	Title of Paper / Author(s)
14:00 - 14:20 Paper 6	A comparison of the lightning performance of the newly designed Eagle pylon and the traditional Donau pylon, based on tower geometry D. Olason, T. Ebdrup, K. Pedersen, F. Faria Da Silva, C. Leth Back
14:20 - 14:40 Paper 8	Experience gained from the operation of an unshielded transmission line located in a low ground flash density area D. Rondeau, P. Prud'homme, C. Potvin, C. Dufour
14:40 - 15:00 Paper 28	Design and Testing of a 225-kV Externally Gapped Line Arrester for installation under live conditions P. Bunov, L. Klingbeil, B. Grossler, C. Pietsch
15:00 - 15:20 Paper 31	Improvements to the protection of overhead transmission lines using lightning detection system in the Mexican Yucatan Peninsula C. Ramirez, G.E. Harper
15:20 - 15:40 Paper 33	The Overvoltage Protection of the 110 kV Overhead Lines of the Island of Bra by the Line Surge Arresters Application M. Puharic, M. Mesic, S. Piliskic, M. Mijoc
15:40 - 16:00	Coffee break

SPECIAL EVENT FOR STUDENTS

10:00 - 12:30 Lectures for students

Chairman Yves Maugain

Alain Xemard	Foreword
Yves Maugain	Introduction
Marc Bonnet	Lightning and lightning detection systems
Ivo Uglesic	Electromagnetic transient calculations
David Dubois	Underground cable technology
Philippe Auriol	The project Supergrid
Yves Maugain	Conclusion

10:00 - 17:40 Students poster session

The price of the best poster will be offered by ALSTOM.

Wednesday, May 14, 2014

Session VI – Physics of lightning and EMC

Chairman Prof Maks Babuder

Time	Title of Paper / Author(s)
08:50 - 09:10 Paper 20	Electro-energetic model for positive and “negative lightning discharges propagation A. Beroual
09:10 - 09:30 Paper 35	Expressions to Correlate the most Influential Variables in the Lightning Induced Voltages on Underground Conductors L. Diaz-Pulgar, M. Martinez, J. Ramirez
09:30 - 09:50 Paper 36	Considering on the Lightning Effect on Human Body in Case of Striking to the Tree M. Izadi, M.Z.A. ab Kadir, G. Nourirad
09:50 - 10:10 Paper 37	Considering on the effect of return stroke velocity changes on the values of lightning electromagnetic fields M. Izadi, M.Z.A. ab Kadir, M. Hajikhani
10:10 - 10:30 Paper 39	Electromagnetic Transients in a Building Struck by Lightning F. Grange, S. Journet, S. Fortin, F.P. Dawalibi
10:30 - 11:00	Coffee break

Session VII – Lightning numerical simulation

Chairman Prof Françoise Paladian

11:00 - 11:20 Paper 19	Investigation on the transient electrical behaviour of overhead line circuits with power cable sections R. Puffer, K. Wenzlaff, M. Riedl, R. Huth
11:20 - 11:40 Paper 41	Computer simulation of lightning surge propagation on power transmission system metal constructions Ilya Dvornikovs, Olegs Sliskis, Karlis Ketners
11:40 - 12:00 Paper 46	Electromagnetic compatibility problems of lightning on Overhead Power Lines N. M'ziou, I. M'ziou, A. Boubakeur
12:00 - 12:20 Paper 48	Transient Grounding Modelling using FEM: Infinite Boundary Condition F. Hanaffi, W. H. Siew, I. Timoshkin
12:20 - 12:40 Paper 21	Evaluation of magnetic fields inside a reinforced concrete building struck by lightning C. Miry, E. Amador, P. Duquerroy, E. Bachelier, D. Prost, F. Issac
12:40 - 14:00	Coffee Break

Wednesday, May 14, 2014

Session VIII – Protection against lightning

Chairman Bernhard Richter

Time	Title of Paper / Author(s)
14:00 - 14:20 Paper 32	A case of optimizing the over-voltage protection of a 110 kV overhead line-cable junction M. Iglic, I. Kobal, M. Becan
14:20 - 14:40 Paper 25	Lightning protection of overhead distribution and transmission lines by multi-chamber arresters and insulators-arresters of a novel design G. Podporkin, E. Enkin, V. Pilshikov, V.E. Zhitenv
14:40 - 15:00	Presentation about the work and results of A3.17 and A3.25 B. Richter
15:00 - 15:20 Paper 47	External Lightning Protection System for Wind Turbine Blades A Preliminary Study A. S. Ayub, W.H. Siew, S.J. Macgregor
15:20 - 15:40 Paper 49	Optimization of the overvoltage protection and analysis of lightning stress in substations J. Plesch, S. Pack
15:40 - 16:00	Coffee break and end of the colloquium

PRACTICAL INFORMATIONS

Overview of the colloquium

Day/Time	Activity
Sunday, May 11 2014 17:00 - 19:00	Guided Tour of the Old Lyon Meeting point: Cathedral Saint-Jean Baptiste, Vieux LYON.
20:00 - 22:30	Diner offered by the Colloquium organization. (Casual clothing). <i>Location: IBIS Villeurbanne - 130 bd du 11 novembre 1918. 69100 Villeurbanne - Phone +00 33 (0)4 78 89 95 95</i>
Monday, 12 May 2014 08:00 - 09:00	Welcome coffee and registration
09:00 - 18:00	Opening and sessions
20:00 - 23:00	Diner offered by the Colloquium organization. (Casual clothing). <i>Location: Brasserie Georges - 30 cours Verdun. 69002 Lyon - Phone: +00 33 (0)4 72 56 54 56</i>
Tuesday, 13 May 2014 09:00 - 16:00	Sessions
10:00 - 12:30	Lectures for students
10:00 - 17:40	Student Poster Session
Wed., 14 May 2014 08:50 - 16:00	Sessions

Important information

- 08:00 Meeting between the presenters and the chairmen of the morning sessions.
- 13:30 Meeting between the presenters and the chairmen of the afternoon sessions.

All lunches breaks will be organized at «Supr'M café».

9 Avenue Gaston Berger. 69100 Villeurbanne

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The colloquium will take place at INSA de Lyon

INSA LYON

Amphithéâtre du Département Génie Electrique

Batiment Gustave Ferrié

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69100 Villeurbanne - FRANCE

Access: Tramway Line T1. Station: La Doua-Gaston Berger.

