

Sessions 7a, 7p

Lightning Protection of Electronic Systems

Moderator's Report

Chairman : E. Montandon
e.montandon@bluewin.ch

E M Consultant
Switzerland

Moderator : Ph. Auriol
philippe.auriol@ec-lyon.fr

Ecole Centrale de Lyon / CEGELY
France

INTRODUCTION

A total of 14 papers have been accepted in 2004 for presentation in this session allotted to ICLP Topic 7 "Lightning Protection of Electronic Systems". This is less than 19 papers in 2002 (Cracow).

Seven papers have been assigned for oral presentation and seven papers for poster presentation.

ORAL SESSION

7-228 Lightning Impact on a Telecommunication Network: Prediction of the surges due to a direct lightning stroke on a tall structure

J. Ribeiro, S. Le Masson, R. Tarafi, A. Zeddani

It needs to be emphasized the paper does not predict what happens to a telecommunication network installed inside a tall structure in case of a direct strike to the tall structure.

It deals with what happens to a nearby line of a length of 200 m in case of an impact to ground compared to an impact to the tall structure. The investigations were performed using software called "Lightning impact on power systems" which uses itself the modified transmission line model in order to describe the special temporal distribution of the lightning current along the channel.

7-103 Simulations and measurements of lightning surges and shielding effect of telecommunication cables

F.S. Moreira, L.M. Laporte, I.J.S. Lopez, J.O.S. Paulino, C.F. Barbosa, N. Carnetta

This paper presents results of computation of induced voltages on aerial cables for telecommunication services due to lightning impact close to or near to the line, and compares this results with experimental tests using triggered lightning in Brazil. (7-104/105 is linked to this paper).

7- 32 Lightning Protection of Telecommunication Electronic Devices

I. Uglesic, V. Milardic, G. Jurin

The paper analyzes damages considered on subscriber premises in Croatia. Those sites are normally fully unprotected. The characteristics of most of the buildings considered: Overhead lines for telephone and power supply, No built-in protection, No main grounding system, TN-C network.

SPD installed between overvoltage category 3 and 2 is reported to be the most effective solution.

7-177 Response of Surge Protection Devices to Fast Current Impulses

M. Edirisinghe, R. Montaño, V. Cooray

Fast current impulses with rise time of 10 ns were applied to ordinary gas discharge tubes and to varistors. The connecting leads of the devices were kept as short as possible. The results are compared with those obtained by standardized impulse current tests.

Question: What kind of installations is exposed to such fast transients when lightning strikes a structure?

7-197 Lightning protection of electronic systems connected with AC power sources and communication & control lines

T. Wakai, H. Sugimoto, K. Nakada, Y. Asaoka, T. Sakai

Experimental investigations are dealt with on electronic systems linked to AC power and information technology

lines. Many different earthing and cable shielding layouts are considered. It is very important not to mix up the specific configurations with the related voltages reported in the contribution.

7-153 **Transient Behaviour of Low Voltage Distribution Systems**

N. Kokkinos, I. Cotton

In this paper are performed some case studies of over voltages and currents through SPD in a 3-phase low voltage distribution system (TN-CS) using buried cable of a length of some 10m. Modelling and simulation are performed by using the ATP-EMTP algorithm.

Note: This paper should be considered in relation to the paper of D. Kokkinos et al "Lightning Protection of Air Traffic Control Radar Systems" presented at this conference too (session 10).

It could be wise to reconsider the requirements for primary SPDs.

7-87 **Evaluation on Protection Distance of SPD to Equipments in Low-Voltage distribution System**

Zhiyong Yuan, Jinliang He, Shuiming Chen, Rong Zeng

An experimental model of single-phase low voltage system was considered, in order to determine the oscillations generated by the feeding of loads through long cables, and to analyze the interaction with the efficiency of SPD.

POSTER SESSION

7-85 **Positioning and coordination of SPS in building**

Tao Xuemei, Ye Feiyu

The paper deals with SPD coordination. It asks to determine the effective protective distance for SPDs near to the equipment. Some statements need to be better explained.

Question: When equipment will be changed, does the coordination with the installed SPDs need to be reconsidered?

7-104&105 **The effect of protection procedures applied to telecommunication lines on the lightning induced surges**

C.F. Barbosa, F.E. Nallin, J.A.D. Rossi, S. Person, A. Zeddarn

The authors present experimental test results of triggered lightning in Brazil and induced surges on two parallel telecommunication lines having a length of 2600m. Different parameters for the protection are: Cable shield, earthing and installation of SPDs.

7-127 **Experimental and Computer Simulation Analyses of Lightning Effects on a Telecommunications Line**

E.F. Gastaldi, J.A. Rossi, J. Pissolato F.

Modelling and computer simulation of the telecommunication line mentioned already in paper 7-103 and 104/105 are explained. Three lightning cases were considered in the simulation: distant (natural), nearby (triggered) and direct strike to the telecommunication line. Comparison with experimental test was performed for the first two cases, since no direct strike could be observed to the specific site.

7-161 **Influence of Lightning, Switching and Temporary Overvoltages on Reliability of Metal Oxide Varistor**

G.L. Aminucci, C. Mazzetti, P. Gentile

The paper deals with the ageing of MOVs. The mean time to failure (MTTF) calculation is explained using different ageing parameters of MOV influenced by the exposure of the MOV to surges caused by switching overvoltages and lightning flashes.

7-169 **Experimental Investigations of Protective Features of Selected Surge Protective Device Sets**

D. M. Krasowski

Experimental results with different combinations and configurations of stepped SPD protection schemes are presented and discussed.

Question: How did the author get the current peak value with the generator specifications as reported in the paper? Further it would be interesting to get information on how the residual voltage at the SPDs was measured.

7-184 **Varistor models – a comparison between theory and practice**

R. Montañó, M. Edirisinghe, V. Cooray, F. Roman

Two simulation models to represent MOVs are compared under the application of fast current impulses. The problem how to measure the residual voltage at the device under test is addressed. The authors conclude there is a need to improve the models for fast current impulses.

7-218 **Testing the Performance of Surge Protection Devices**

J. Schimanski, K. Scheibe, M. Wetter

The paper presents a test apparatuses for some type of SPDs in order to get useful information about a possible degradation of the SPD in due time. The need for local or remote monitoring of the status of SPDs is also addressed.