Sessions 10a, 10p

Lightning Protection and Lightning Testing Standards

Moderator's Report

Chairman: Carlo Mazzetti
Moderator: Alain Rousseau

Ten papers have been proposed for this session. They can be subdivided in two groups: "criteria for designing LPS" and "SPD designing, installing and testing". Papers are well distributed between the two subjects with 5 papers for each topics.

Most of the papers are dealing with proposals to improve existing standards. This is clearly demonstrating that common standards are now well used worldwide (even if some adaptations are sometimes needed to take care of local specific needs) and that experience is now coming from user and laboratories and not only from standards working group members.
Results of the discussion during the conference based on these papers are of primer importance for standards lightning protection groups and especially IEC.

This is particularly true for paper 10.2, titled **"A Critical View on the Lightning Protection International Standard"** presented by IEC TC81 Chairman who is summarizing the situation of IEC TC81 which will be publishing a new series of 5 standards soon. He makes some proposals for improving the standards for example regarding lightning interception models, risk assessment or earthing systems

Paper 10.7, **"Further South African experiences with the application of the International Electrotechnical Commission (IEC) lightning protection standards based on their application at four major installations"** presents the application of IEC standards regarding lightning protection and earthing in four different industrial sites. This application is following problems encountered in these sites due to lightning and is considered as remedial work. Main conclusions of the author are that lightning protection was previously badly documented, that LPS were not integrated LPS (i.e. including internal protection and EMC principles), that equipotentiality was poor and that earthing systems were inappropriate. After completion of the job in accordance to IEC rules, three lightning seasons (6 for two of the sites) led to no damage. This paper is an interesting and well documented field application of IEC standards.

Paper 10.p2, **"Lightning Protection Standard in Mexico based on IEC-1024 and Practical Aspects."** is presenting how Mexican standards apply IEC 1024 to suit their specific needs. This is an interesting integrated approach which is also specifying what the minium content of the lightning protection documentation should be.

Paper 10.6, **"Feedback on the lightning protection of high-risk industrial facilities in France"** presents also site applications but through a satisfaction survey in France. Result of this survey are that 25% of the industrial sites are stroke near every 5

years and that most of the damages are related to equipments and not to the structures but only 40% of the sites are protected by SPDs. In order to correct this new measures are presented which are based on risk assessment according to IEC 62305-2 followed by a technical survey and installation performed by professionals certified by an independent organization.

Paper 10p.1, **"Additional Criteria for Designing Lightning Protection of a Complex of Structures (LPCS)"** suggests to introduce in the risk assessment another parameter related to the interruption of the service. In addition, the paper presents a way to calculate the collection area for complex building (i.e. a group of building having overlapping collection areas). By studying the protection of complex buildings globally protection may be improved especially for the main building.

Paper 10p.3, titled **"Discussion and suggestion on SPD standardization"** is presenting the application of SPD standards in China. Most of them are based on IEC ones and large laboratories have been developed to be able to test the SPDs. Some questions are asked based on the standard applications such as use of 10/350 waveshape and coordination between SPD and its disconnectors. Other questions are related to testing procedure or comparison between TC37 and SC37A standards. This paper is a basis for IEC SPD standards improvement and should be a basis for interesting discussion during the conference and also in IEC meetings.

Paper 10.3, **"Protection against Lightning Overvoltages of Electrical and Electronic Systems: Evaluation of the Protective Distance of an SPD",** shows that the protective distance of an SPD is a function of the conducted surges and also of the induced overvoltages in the SPD-equipment loop. This last point is important as it is generally not discussed in IEC standards and may request specific protection measures. In addition, the voltage drop along the SPD lead lengths should be used for the evaluation of the effective protection level of the SPD.

Paper 10.5, **"Effect of Distance on Surge Arrester Location: Comparison of Recommended Practices"** is dealing with the same topic but for MV and HV arresters. The paper presents a comparison between methods given by standards (IEEE and IEC) and EMTP simulations. The IEC method appears to be the closest. Improvement in this field is still needed for standards.

Paper 10.1, **"A Call to Standardize the Waveforms Used to Test SPDs"** is dealing with an interesting scientific and historical study of the basis for the waveforms used in SPD testing. The author makes many proposals especially regarding the 10/350 waveform. He suggests that, as IEC is revisiting SPD standard 61643-11 it may be necessary to revise parameters associated with this waveshape and especially the specific energy W/R.

In the same way, paper 10.4, **"Black Boxes, Blind Spots, and Disconnectors: How not to test SPDs"** deals with necessary improvements on the SPD standards. Black-box testing as well as function of disconnectors are key issues which need to be addressed among others listed and well documented by the author. This will lead to an exciting discussion during the conference provided that standard officers (IEC, IEEE) are present at the conference.