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CIGRE – Session 2008

Panel discussion on

CIGRE – a Learning Platform In Electric Power Engineering

My contribution to this panel reflects on my personal experiences of more than 35 years of CIGRE-membership. Let me start with a short review of my business life. Most time I was involved in development, design and manufacturing of large power transformers in different positions and management levels at one of the leading transformer manufactures.

My CIGRE-career started in 1972 with the presentation of a CIGRE-paper on extra large GSU-transformers at the Paris session. From 1982 until 1994 I joined Study Committee 12 Transformers as the ordinary German member and from 1994 to 2000 I was the chairman of SC 12, now SC A2. In this position I was member of the Technical Committee of CIGRE. During all that time I participated actively in several working groups, organised the 1983 Transformer Colloquium in Aachen, acted as Special Reporter and contributed several papers and reports to the biannual Paris sessions and the transformer colloquia which happened every uneven year.

Most of these activities were performed outside my regular business time; it was my personal investment of time, but supported by my company, who paid fees and travelling costs for the sessions and group meetings. It was no waste of time neither for my company nor for myself, but an enrichment in my business life.

What is the benefit and who has the profit of the engagement in CIGRE activities?

I. Let me first address the benefit for the companies, who participate in CIGRE and delegate representatives in the active bodies.

I.1. Exchange of information

CIGRE is a unique platform for informal discussions between technical experts of all management levels representing industry, utilities, scientific institutes and universities.

The CIGRE organisation presents a paramount network round the world for the exchange of information on future development of new technologies, their promises and impacts including actual trends in the development of supply philosophies and markets.

These information is of high value for management decisions of industry and utilities. Hence companies must be interested to have access to this pool of information and knowledge and moreover to participate actively in the setting of trends according to their business goals. Therefore it pays off to send representatives into the working bodies and to strive for leading positions in the organisation.

I.2. Learning platform

In addition it is of great benefit for companies to get their technical junior staff trained in working groups and task forces by experienced experts. This training is of high quality at low cost, but with a high output. When I was a young engineer it was a challenge for me and as well a benefit for my company to meet experienced “old guys”, listen to them and discuss with them at the CIGRE meetings and use their knowledge to improve my technical capacity.

I.3. Sharing of experience

Furthermore the participation in specific activities and the exchange of information on a non-official personal basis can result in real economic benefits. Let me give an example.

In the mid-nineties some severe transformer failures in different parts of the world were observed. The reason of this kind of breakdown seemed to be some what mysterious and in the first round nobody wanted to discuss the phenomenon on the open market. But with time going on the number of similar faults increased and it turned out that most of the transformer suppliers and users involved faced the same problem. When investigating and analysing the faults it was obvious that a deposit of copper sulphide was responsible for the breakdown of the solid insulation system. It was evident that there existed a general problem and an open discussion started because all parties, the suppliers as well as the users, were highly interested to find out the mechanism of the fault evolution, its origin and suitable countermeasures and procedures to prevent further damages and to avoid the breakdown of more transformers and in consequence the loss of money.

Study Committee A2 immediately set up a Working Group to study the problem and to recommend procedures for the protection of transformers which are endangered and to improve the selection of material involved in the failure mechanism.

The WG was able to present a preliminary report within rather short time due to the fact that recognised experts from different companies worked together and shared their skills and experience.

I.4. Standardisation

The goals of CIGRE include the initiation and basic investigations preceding common worldwide technical standards. The active participation in this work offers the chance to influence the content of common rules and to prevent adverse and unacceptable results. Again the compilation of diverse views, skills and knowledge and the free discussion of all relevant aspects is of high value for the individual as well as for companies. There are many examples, which confirm the paramount role of CIGRE in the standardisation procedure due to the close links to IEC. Many experts are involved in both organisations ensuring the optimal transfer of results. Two stories out of many others may confirm the successful collaboration.

More than 30 years ago the development of semiconductor elements for high voltage application initiated the renaissance of DC application for the electric power transmission. At that time no common rules and standards for the DC high voltage testing of HVDC equipment existed. Specific test procedures were agreed upon between manufacturer and user for each individual project. But very soon it became evident that binding standards were necessary for the evaluation of bids and to

ensure safe service. CIGRE reacted by forming a new Study Committee for HVDC and Power Electronics B4, former A14, who presented in cooperation with other SCs recommendations for test procedures and standards which are now worldwide accepted and applied.

The second example relates to the standardisation of DGA procedures and their application to transformers. In the early seventies Doernenburg, head of the chemistry lab of Brown Boveri presented first results of a statistical evaluation of DGA results and a scheme for the fault analysis of transformers using the dissolved gas in the transformer oil. Again two SCs formed a WG with experts in transformer technology and in oil chemistry, who collected data and investigated the mechanism of decomposition of oil under various stress conditions. The output of these extended studies formed the basis of the relevant IEC standards now in use. To day DGA is one of the most powerful tools for the detection of beginning faults and saves a lot of money caused by avoidable breakdowns of the system and prevents the damages of units by early warning.

II. Coming to the personal benefits the individual CIGRE membership is also of high value especially for young ambitious engineers. And this is valid in two directions: it serves the business carrier and it promotes development of the own personality.

II.1. International personal contacts

The participation in CIGRE opens a platform to present papers on actual subjects and to take part in the discussions at the regular Paris meetings. Besides the opportunity to meet experts with different views and experience is for non-English speaking people an excellent chance to exercise and train foreign languages, in particular English and French. Additionally it offers the opportunity of travelling and see other technical solutions on site in other countries because the meetings take place round the world.

II.2. Increase of knowledge

An excellent source for learning and understanding new upcoming trends in the development of technical systems, applications and market changes is the personal active cooperation in Working Groups and Task Forces where specialists exchange their views and present the latest information on the subjects under discussion. My personal experience was that I learnt a lot about the different approaches and philosophies in the design and application of transformers in different countries. For example: German utilities traditionally prefer generator-step-up transformers with on-load tap-changer, whereas in the US untapped or transformers with no-load tap-changer are preferred. The same is valid for the choice of transmission transformers with separate windings, preferred in Germany, or of auto-transformers which are in use in many countries due to different grid conditions and philosophies. That makes a big difference in the design.

II.3. Personal and social contacts

Participation widens the horizon and offers the opportunity to get in contact with other members of the international network of experts, whom you can meet also outside the CIGRE frame, if you need a special information or support. Also the social

events, technical visits and cultural excursions which are an essential and popular part of most meetings offer the chance to meet people and make friends. Again my experience was that several contacts to international colleges developed into close and friendly relations far beyond the business aspects. Many of them are still valid and they will last. Recently we had a weekend-meeting with ten retired “Cigreans” and their spouses from five European countries and we decided according to good CIGRE tradition to meet again every second year and fixed the next two dates and meeting places!

III. Summary

CIGRE is a value, not profit oriented organisation. That makes it possible to cooperate in projects of mutual interest and at the same time persecute personal or company goals.

Last not least is CIGRE a society with its own unique spirit which is based on trust and confidence and respect and recognition of all members.