



Session 1: SESSION ON AC ELECTROMAGNETIC FIELDS FROM OVERHEAD LINES, UNDERGROUND CABLES AND SUBSTATIONS Conclusions

- **Measurements and calculation of EMF are no longer a technical issue : measurement equipments and computation softwares have been commercially available for several years and measurement procedures are now standardized.**
 - **Mitigation techniques, an important topic for CIGRE :**
 - the basic techniques are established and have been addressed in a recent CIGRE booklet,
 - mitigation principles are under industrial development for overhead lines,
 - shielding techniques for undergrounded cables are more mature since there already exists some commercially available techniques,
 - the dissemination of these new techniques have opened new studies : ageing of undergrounded shields, cost/efficiency and maintenance problems.
- >> When addressing the question of “how to mitigate”, CIGRE may avoid an other one “why to mitigate”, which is more fundamental (mitigation only to meet the standards ?)**



Session 2 : SESSION ON DC ELECTROMAGNETIC FIELDS FROM DC OVERHEAD LINES, DC CONVERTER STATIONS Conclusions

- **There is a need for more consistent long-term measurements of electric field (including space charge effect) and ion flows near HVDC lines in operation. This will be useful for understanding the statistic behavior of this phenomena and to calibrate the results of calculation.**
- **Studies and methodology analysis should be continued in order to define reliable ways of electric field and ion flow calculation.**
- **Perception of the field by the population is one key aspects to address the objections of the public. When building transmission line and railways, people in the surroundings should be made aware of how the fields affect the ambient and persons (communication)**
- **Medical applications (MRI) generate DC magnetic fields at much higher levels**

- **Reaffirmation of CIGRE position paper that exposure limits should be based on internationally accepted guidelines.**
- **Research efforts on extremely low field levels have been very important and have not shown any clear effect with childhood leukemia. Future researchs should focus on the effect of higher magnetic fields (1000 to 10 000 uT) on the central nervous system to improve the scientific basis of the existing guidelines.**
- **Within a new WG ? >> To be discussed among SC C3**
- **ICNIRP Revised recommendations will be at disposal on the ICNIRP website, to be commented by all experts.**



**SESSION ON EXPOSURE TO ELF FIELDS OR MAGNETIC FIELDS
Conclusions**

- Emergence of studies characterizing the ELF-EMF surroundings
>> needs for complementary studies to strengthen confidence
- Utilities have developed studies to check the compliance of workers' live environment to the European Directive
>> additional contributions should help on-going standardization
- Cardiac implants and occupational exposure : normalization will give some advices, but for special cases, studies are necessary
>> creation of a CIGRE WG on the procedure aiming at testing ICD ?
- Why not normalizing ICNIRP thresholds values into a CENELEC standard ?
- Suggested open issue : How to go from academics results to communication tools in order to reassure larger audiences (utilities workers, farmers, the public, the authorities, the justice...)

Session 5 : ROUND TABLE

Conclusions

- **There are different situations in different countries regarding either voluntary or compulsory EMF regulations. WHO is promoting harmonization of EMF standards worldwide.**
- **It has been observed that in most of the countries that have enforced precautionary EMF regulations, risk perception and public concern have increased rather than reducing, and no better acceptability for EMF based technologies has been achieved. Therefore, implementation of precautionary policy has to be well thought out.**
- **Communication with public is very important – ways for proper communication with public have to be explored.**

- **A successful colloquium :**
 - Attendance
 - Quality of papers
 - Lively discussions

- **Confirmation of shared concerns on the selected issues**

- >> **New collaboration tracks :**
 - R&D : medical studies, and proposal for a new WG within C3
 - Standardization
 - New CIGRE WG on ICD procedures
 - Communication (via ENTSOE) , ...

- >> **New colloquium in PARIS in 2011 :**
 - Medical studies
 - Standardization
 - Mitigation, DC OHL, UGC, and submarine cables