

NOTE ON PLT IN RELATION WITH EMC ASPECTS

The results of some field trials with PLT networks in operation have already been presented in the Cenelec-ETSI JWG. Special attention was given to the presentation of several interesting and extensive PLT field trials during the last WP meeting at the Commission.

Of particular interest were the studies taking into account the statistical aspects.

The present note attempts to extract from all those studies the most significant common conclusions.

All these studies rely on measurements of radiated fields.

Radiated fields due to PLT and relation with background noise

- Radiated fields (normally at 3 m distance) due to PLT networks in operation range between 30 dB micro-volts per meter up to 60dB. (about 40 dB as average value).

The highest values are observed close to the injection points (usually MT/BT substations)

- The NB 30 radiated field limit values are quite largely exceeded in many cases, whereas the limit of 55dB micro-volts per meter (derived from the CISPR 22 telecom common mode current limit by the Biot –Savart- law) is either not exceed or exceeded with a relatively small probability (20% of measured values)

- Radiated emissions due to PLT “**emerge**” from the background electromagnetic radiated noise (due to all other sources of interference) in rural areas. In urban areas, PLT contribution is hidden in the background noise up to about 10MHz but is above that noise by a margin of 14-20dB at higher frequencies, especially from 20 to 30MHz.

- In the higher frequency band (10 to 30MHz) PLT operation with present technologies has clearly the **potential** to interfere with radio services, as emission levels are high compared to useful radio signals.

Complaints

Although measured radiated fields are high compared to useful radio signals in the upper frequency band (10 to 30MHz), practically no complaints have been recorded from the users, during the relatively long operation periods of the PLT systems.

There are various opinions provided to explain this fact.

Measurement technics and procedures

-In house, indoor-radiated field measurements appear to be highly unpracticable and seem not to be usable to assess a network, as would be required by a harmonised standard for networks.

- Out door radiated field measurements seem to be feasible, although some reservations have been expressed for their applicability in standards to assess the conformity of networks.

Cumulative effects at far distance

- Reports are contradictory regarding the evaluation of risks due to PLT in this respect. No experimental data seem at present to be available demonstrating important risks of cumulative effects at far distance.

Other aspects

- Other broadband networks (e.g. VDSL) may produce radiated fields comparable to PLT
- Various PLT technologies may have different interference characteristics.

Relation with the draft emission standard for telecom networks prepared by ETSI-CLC JWG

- In the absence of consensus in the JWG, two limits are proposed in the draft to NC's (in brief NB 30 and CISPR 22). These radiated limits in the draft have to be respected by the maximum measured values from a network at 3m distance.
- It appears clearly that nowadays PLT systems in operation are not complying with NB limits (when considered as maximum allowable in all locations). Nowadays PLT networks may probably with some precautions (limitation of maximum injected power?) comply with the limits derived from the CISPR telecom port common mode current limits (derivation by Biot-Savart law)

Remarks:

- 1) A direct precise comparison of the different technical reports is difficult because the injected levels by PLT modems are not given by using a common standard measurement basis*
- 2) This note is not dealing with the product compliance aspect of the PLT modems. This issue is however the most crucial one as it would permit the CE marking of the PLT products. The preparation of a relevant PLT product emission standard is dealt with by CISPR I (not by the CENELEC-ETSI JWG) and information on the progress in this domain is very important*

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