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Contribution to the EC Workshop on Powerline Communications

Introduction

TDF, one of the main TV and Radio transmission operator in Europe, is deeply concerned by the introduction of PLC networks and equipment as they present high interference risks to radio reception in frequency bands below 30 MHz.

The use of the electricity grid to provide an alternative broadband infrastructure makes sense as it stimulates competition between telecom operators and presents low deployment cost. However, TDF and most of the concerned spectrum users feel that the PLC system is introduced without preliminary thoughts and considerations for radio regulations and EMC directives (which state that the operation of telecom and power distribution networks shall not cause harmful interference to radiocommunication services).

There is a downside to the use of existing mains cables for data transmission. The wires were not designed as communication cables for this new application, and as a result there is the undesirable side-effect that the data signals 'leak' and have a strong potential to cause interference to radio systems. In effect, mains cables can not be considered as a guided medium like twisted pairs or coaxial cables, since the wires act as uncontrolled transmitting antennas. Moreover, to overcome difficulties due to poor cable matching, multipath and noise, as well as the long distance between modems, PLC equipment uses quite high level power injection, increasing again the risks of interference.

It is important to remember that the LF/MF/HF bands have specific and unique propagation features (principally long range ability). Consequently applications using these bands cannot be transposed. Therefore the requirement for the use of the frequency bands below 30 MHz by radiocommunication services will remain strong.

DRM system

New digital technologies make it possible to further exploit the potential of these bands like the Broadcasting service DRM (Digital Radio Mondiale). DRM is the world's only non-proprietary, universally standardized digital system for short-wave, medium-wave/AM and long-wave transmission that can use existing frequencies and bandwidth across the globe. With clear, near-FM quality sound and excellent reception, DRM offers a dramatic improvement over analogue, it will surely revitalize radio in markets worldwide. DRM can integrate audio with data and text, so additional content can be displayed on DRM-capable receivers to enhance the listening experience. DRM applications include fixed and portable receivers, car radios and PC-based receivers. And many existing transmitters can be easily modified to carry DRM signals as well as analogue.





DRM reached an important milestone in January 2003, when the IEC gave the DRM on-air system its highest stamp of approval – International Standard.. In May 2003, DRM received another plaudit, when the ETSI further endorsed the DRM system as a universal standard that is applicable in markets worldwide, in alignment with the IEC standard. ETSI also published the datacasting standard for DRM as an ETSI Technical Standard. In June 2003 during the ITU's World Radiocommunication Conference (WRC2003) the world's first live, daily DRM broadcast toward Geneva and across the globe started. Various DRM receivers are expected to be available in shops in late 2004.

Similarly, the fixed and mobile services will also be making increased use of digital technology.

Interference to radio and standardization aspects

TDF and other broadcasters representatives have been participating for a while in most of the debates surrounding the emission limits issue and have produced several contributions to CEPT, ITU and ETSI-CENELEC JWG ad hoc groups proving the interference risk to AM and recently to DRM reception. The problem we have had with the debates gathering radio and PLC proponents, is that neither side seems particularly concerned by what the others are saying or demonstrating. This, certainly because PLC and radio do not have the same regulatory play ground and also because the goal of the emission limits, the most salient point of the debates, is not clear.

If the purpose of the limits is to protect radio the way forward is clear, if the purpose of the limits is to allow PLT to function properly, the way forward is also clear. Because limits proposed by each party are so far apart (50 dB or so) no compromise is possible and a mutually-exclusive decision/choice must be made between them !

The on going standard drafting process for the Harmonized product family emission standard for telecommunication networks (draft EN 300 262) treated by the ETSI-CENELEC PLT JWG under EC mandate M313, clearly shows as it stands, that the technical debate for limits under 30 MHz lead to nowhere. There is now a general feeling among radio users that the debate has now left the technical scene, whatever the technical arguments and demonstrations being proposed (ie the remaining set of 2 options for radiated limits sent to the NSO's for consultation which are similar to or higher than the levels utilised by radio services ...).

That is why TDF and many broadcaster prefer to have so far no radiated limits and measurement methods defined below 30 MHz, remaining in line with the existing EN55022 conducted limits.

TDF feels that cooperation work between PLC developers and spectrum users was completely neglected; common work done at the outset under a clear EC and CEPT mandate or project would have given yet better results. PLC equipment were developed until now without any consideration regarding the frequencies sharing criteria and emissions issues on radio, which led to the current conflicting situation.

Further work can still be encouraged between both parties especially on alleviation techniques such as spread spectrum, silent idle mode (current PLC modems send interfering bursts of data even when no traffic is generated by the users !!!...), common compatibility tests PLC/AM and DRM, etc.

Regarding the broadcasting service demonstrations of the impact of emissions limits for PLT networks on analogue AM reception can be found on the European Broadcasting Union (EBU) web site under :

http://www.ebu.ch/departments/technical/broadcast_technology/mainplt/web_version_comparison_of_limits.html

Similarly, online demonstrations of the impact of PLC emissions on DRM reception, will be available soon.