

Draft Measurement Plan to Assess the Radiated Emissions from PLT (Power line Technologies) systems and their likely impact on radio services in the band 1.6 MHz to 30 MHz

1. Introduction

This document provides the framework for discussions to prepare a test plan to determine the likely emissions levels from two types of PLT applications:

- (a) **PLT Access (LOCAL LOOP)** – This provides telecommunications services to the building, from the local substation. Generally, the feed to the sub station is by means of fibre optic.
- (b) **PLT Home networking** – This is essentially a "HomeLAN" type system, which utilises the domestic wiring within the building.

The measurement plan also deals with objective & subjective tests to assess the effects of PLT emissions on other radio based services operating the band and are listed below:

- Medium and short wave AM broadcasting reception
- " Digital (DRM) broadcasting reception
- Amateur radio communications
- Military and other Government radio users
- Other ?

It is the intention of the Radiocommunications Agency (RA) to ensure that as far as is practical, both the test configuration and the potential interference scenarios to be investigated will be as representative as possible of typical situations that would follow PLT deployment in the UK. It is the Agency's wish therefore that members of the Technical Working Group will feel free to contribute and provide comment on these proposals.

2. Objectives

The purpose of the PLT measurement programme is to,

- 2.1 discover the range of radiated emission levels, likely to be encountered in practice, at 1, 3 and 10 metres respectively from a representative PLT installation.
- 2.2 utilise the information gathered from measurements of single representative PLT installation to predict the nature and extent of cumulative emissions from multiple PLT units.
- 2.3 determine by both objective and subjective assessment, the range of likely effects that the measured or calculated PLT emissions may have on representative radio communications systems located at various distances from PLT circuits;
- 2.4 inform UK, European and International standards bodies who may be engaged in deriving suitable radiated emission limits for the protection of radio communications services from undue interference caused by radiated emissions from systems.

3. Measurement Procedures

The measurements to be made accordance with the method defined in MPT 1570 part C (draft April 2000).

In addition, where they may differ, it is also intended to test the measurement procedures contained in the joint RA/RegTP document '*In-Situ Measurement Procedures and Proposed limits for Radio Disturbance Emissions from Telecommunication Networks*'. The latter was submitted jointly by the German and UK administrations to CEPT/ERC SE PT SE35 under reference SE35(00)29, for consideration as a basis for a standard and inclusion within a first draft of a proposed ERC Recommendation.

4 Time Scale

The measurements and the report should be completed so it can be included in the TWG report in September 2001.

5. Specification for PLT Equipment Under Test

5.1 Configuration of Test Set-ups

5.1.1 PLT Access (Local loop)

A PLT access network (local loop) comprising access band PLC head-end installed at the substation and matching modem at house. To perform the BER (bit error rate) measurements the data loop-back at the substation is required. This set-up would provide BER testing around the subscriber loop from the house. Alternatively a PC may be used to transfer files and record the errors

5.1.2 PLT Home networking

In accordance with the adhoc meeting of the TWG sub group on PLT held on 8th May at RTCG Whyteleafe, it is presently proposed that the TWG does not undertake practical in-situ measurements of so called PLT "in House" systems. It is understood that nSine, who are represented on the TWG, have commissioned an independent programme of practical tests using a range of different building types. nSine have kindly offered to share the results of their work and it is intended to consider this within the TWG.

5.2 PLT Test Signals

[Brief description of PLT test signals] [RF & baseband characteristics of the Info required]

5.3 Test Site(s)

[To be decided / agreed]

5.4 Test set-up

[To be decided / agreed - according to 5.3]

6. SUGGESTED TEST EQUIPMENT REQUIREMENTS

6.1 Loop integrity Tests

BER measurement equipment

Calibrated CISPR current clamps.

6.2.1 Radiated Emission Measurements

6.2.1 Receiver: A calibrated CISPR measuring receiver fitted with Peak, Average and Quasi-Peak detectors and selectable 200 Hz or 9 kHz IF bandwidths.

6.2.2 Magnetic Field Antennas: A plane wave calibrated, CISPR magnetic loop antenna having an H field Antenna Factor of -31.5 dB S/m giving a plane wave E Field Antenna factor of 20 dB/m.

A set of 3, high sensitivity, calibrated magnetic loop antennas having Antenna Factors approximately 25 dB lower than the standard CISPR loop antenna.

6.2.3 Electric Field Antennas: A plane wave calibrated CISPR E Field Rod Antenna having a plane wave E Field Antenna factor of 20 dB/m.

[A plane wave calibrated, short active dipole antenna with E Field Antenna factor of 20 dB/m.]

A high sensitivity, plane wave calibrated, E Field rod antenna. (Antenna Factor TBA)

6.3 Subjective Assessments

6.3.1 A small range of domestic quality portable AM Medium and Short wave broadcast receivers encompassing both ferrite rod and whip antennas.

6.3.2 [A prototype or early production Digital Radio Mondiale (DRM) receiver]

6.3.3 A semi-professional HF communications receiver connected to an external, electrically short, active broadband antenna of the type sold for general Short Wave reception.

6.3.4 A typical HF Amateur Radio transceiver with a small selection of amateur band wire dipoles and loaded vertical antennas.

6.3.5 [Any Military and OGD equipment will be provided and operated by the parties involved]