

# Power Line Communication System Turns Street Lamps into Broadband Transmitters

Keywords: power line communication, PLC, interference, street lamp

Public safety organizations and radio amateurs in the Linz region of Austria complained that their radio systems were interfered with by a commercial PLC broadband service. The Austrian Telecommunication authority investigated the complaints.

The investigators measured the wireless emissions from several PLC repeaters in the area, which operate in the 2–30 MHz band. It was found that they all exceeded the ECC/RCC(05)04 guideline — sometimes by more than 50dB (a factor of 500).

Mercury vapor lamps are used for street lighting in Linz. The investigators measured the field strength around one street lamp and found it to be much higher than the emissions from any of the PLC repeaters (and 56 dB above ECC/REC(05)04). All their measurements were taken at a distance of 3 meters (15 ft), so the results can be compared.

The investigators used a spectrum analyzer and found that the mercury vapor lamp emitted radiation over a very broad spectrum, reaching all the way up to 3 gigahertz. They speculate that the frequencies of the PLC signals on the power feed acts on the mercury plasma in a non-linear way to create the stronger broad spectrum radiation.

It would have been interesting if the report had included a spectrum analysis of the emissions from the mercury vapor lamp with and without the PLC system active, for comparison.

The electrical power distribution system was not designed to carry communication signals and thus may interact with it in unpredictable ways, as here seen. Whether there are other types of lamps, electronics or other components connected to the grid, which create unintended consequences of a PLC system, remains to be discovered.

## Reference

*PLC interference: Report about measurements concerning power line communications systems (PLC), and harmful interference caused by PLC in the HF bands 2000 – 30,000 kHz*, Federal Ministry for Transport, Innovation and Technology (Austria). Presented at CENELEC/ETSI JGW, February 2006.