

BPL RADIATION FROM HOUSE WIRING: TECHNICAL COMMENT

On the NPRM Docket No.04-37, and on the subject of the NTIA technical report, and on measurement guidelines:

The requirements and measurement guidelines for Access Broadband over Power Line Systems, and also the NTIA technical studies, consider primarily the radiation from the power lines themselves, or the direct connections to the power lines.

HOWEVER, the majority of the unwanted radiated emission will likely come from wiring within private houses. The mechanism that otherwise PREVENTS excessive radiation from power lines is the fact that they are BALANCED. Out-of-phase currents in the 2 conductors cancel.

CONSIDER the wiring to lighting circuits inside a private dwelling. The switch to control one lighting fixture is usually a single-pole switch. If a given domestic light is turned OFF, then from the point of that single-pole switch to the light fixture there is in effect a single conductor. This unbalanced conductor will be an efficient radiator. In a given dwelling there may be 20 or more such lighting circuits, with a wide range of conductor lengths between lighting switches and the lighting unit. With such a variety of conductor lengths, almost every frequency within the BPL spectrum will find a conductor that is a reasonable match to the BPL signal within the house wiring transmission line. In other words, most, almost certainly more than half, of the BPL power that enters into the private dwelling wiring will end up being radiated.

This was not taken into account by the NTIA studies, nor by the NPRM considerations, and not by the measurement guidelines. This will also make measurements of field strength extremely difficult; if one householder turns one light on or off, then the radiation in the neighbourhood may be drastically altered. Repeatable, so meaningful, measurements of unwanted emission will be nearly impossible.

I believe the radiation from unbalanced domestic dwelling lighting wiring has not been taken into account by any of the studies, and yet such radiation will likely dominate the unwanted emission from BPL systems.

Sincerely,
Dr. D.T. Emerson