

Current Technologies, LLC
Experimental License Progress Report

Under its experimental license, Current Technologies, LLC ("Current") has been operating its proprietary powerline communications ("PLC") equipment installed on both "low voltage" and "medium voltage" electric power distribution lines. In short, these experimental operations validate the capabilities of PLC technology. Current's proprietary PLC equipment continuously delivers always-on, symmetrical broadband speeds (in excess of 2 Mbps) to virtually all of the existing electrical outlets in the customer premise over the electric utility's low and medium voltage power distribution lines. This PLC equipment forms a communications path that safely bypasses the step-down transformer segregating the low and medium voltage power lines. Installation of Current's PLC equipment takes only a matter of minutes for a utility lineman and causes no disruption or degradation of electric distribution service during installation or operation. Current has also demonstrated delivery of enhanced power distribution services, such as automated meter reading, using its PLC equipment.

Testing was done at three representative installation sites pursuant to the specifications of ANSI C63.4-1992 and 47 C.F.R. § 15.31(a)(6). Several safety considerations preclude Current from taking test measurements at a distance of three meters from the site at which some of its PLC equipment is installed on the electric distribution lines. For instance, the high power levels on the medium voltage lines and the proximity to such lines at which some of Current's PLC equipment is mounted often preclude safe testing within three meters. Additionally, the height above ground at which Current's PLC equipment is mounted on aerial electric distribution lines may also preclude safe testing within three meters in some circumstances. Accordingly, in certain circumstances measurements were taken at a distance of 10 meters from the PLC devices and the results were extrapolated accordingly. At each test site, measurements were taken on multiple radials from the point of equipment installation.

Current has conducted testing of equipment operating on frequencies both above and below 30 MHz. The results confirm that peak emission levels emanate from the precise point on which Current's PLC equipment is installed on the electric distribution line and that such emissions dissipate in a monotonically decreasing fashion as the measurement point moves further from the equipment installation point. Thus, Current's low and medium voltage PLC equipment emits RF energy like a point source emitter. For equipment operating above 30 MHz, at each of the tested installation sites results were similar with no statistically significant variations. Current's testing to date indicates that, for equipment operating above 30 MHz, maximum radiated emissions at 10 meters were no more than 28.2 $\mu\text{V/m}$, which extrapolates to no more than 93.8 $\mu\text{V/m}$ at three meters. These emissions are within the Class B levels prescribed by the Commission's rules for the respective frequency bands. 47 C.F.R. § 15.209(a). Similarly, emissions from equipment operating below 30 MHz were also within

the Class B limits, although certain test locations have yielded discrepant results. Current is conducting further testing to confirm the basis for such results and will report the maximum radiated emissions when this testing is completed.

Current's on-site field-testing also confirmed that determining appropriate measurement specifications is critical to accurate Part 15 compliance testing for PLC equipment. Certain portions of the frequency band covered by Current's experimental license contain narrowband signals of greater power than the low level broadband signal used by Current's PLC equipment. Accordingly, repeatable and dependable test results can be obtained only through careful attention to measurement details such as the dynamic range and selectivity of the measurement receiver, placement of the test equipment antenna, and an understanding of – and ability to isolate – the actual signal being tested. Failure to use the correct parameters can produce inaccurate test readings.