Radio Frequency Measurement Services

/// FIXED NETWORK ENGINEERING SERVICES PORTFOLIO ///

Fixed Network Engineering

RADIO FREQUENCY MEASUREMENT SERVICES

Whenever radio equipment is deployed, the operator is mandated to comply with certain Radio Frequency (RF) emission safety guidelines, as defined by the FCC. Operators must also consider the impact of other nearby radios on their system and the impact of their own radio on other systems. Without proper planning and environmental characterization, operators will risk system degradation due to direct interference or receiver desensitization caused by collocated systems or other radios within the vicinity of the installation. RF measurement services address these concerns and have been at the forefront of LCC's service portfolio since its inception. LCC has an extensive history of performing frequency measurements for a variety of service providers and network operators. LCC's engineering teams bring field-proven experience in providing turnkey measurement services.

LCC's Fixed Network Engineering Department offers a variety of field measurement and site simulation services for characterizing the RF environment for the purposes of identifying interference or confirming FCC compliance.

SERVICES OFFERED

> **Maximum Permissible Exposure (MPE) Analysis** – LCC will use a software simulation tool, RoofView®, and/or in-field RF measurements to determine a carrier site's compliance with the FCC mandated RF exposure limitations for uncontrolled and controlled environments (OET Bulletin 65). Signage and access recommendations can also be provided.

> **Collocation Radio Frequency Interference (RFI) Analysis** – Using a software simulation tool, Comsite Pro®, LCC will perform a complete RFI collocation analysis for the site of a prospective system installation. The analysis evaluates intermodulation products, transmitter noise, and harmonics of existing RF systems to identify potential interference and receiver desensitization issues for the new installation.

> **Spectrum Sweep** – Using a portable spectrum analyzer and application specific antennas, LCC will perform a 360° horizon sweep at a prospective site to measure noise floor and identify significant carriers in the vicinity. This service is mostly requested prior to unlicensed radio installations, but it may also be useful for interferer searches.

> **Interferer Investigation** – In the event of direct system interference, LCC will use a portable spectrum analyzer and application specific antennas to triangulate the location of a suspected interferer.

> **RF Safety Training** – LCC provides training to field techs, engineers and site acquisition personnel on the effects of electromagnetic energy. Upon completion of the course, the attendees will have an understanding of MPE standards (OET Bulletin 65) and ways to minimize exposure to RF radiation.

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In LCC's previous experiences, site characterizations and interference studies have often been bundled with microwave design and installation projects. LCC also has an extensive history of performing microwave engineering services. The following selections summarize some of LCC's previous experience with RF measurement projects.

PROJECT EXAMPLES

- For a national wireless data services operator, LCC has performed over 200 spectrum sweeps throughout 17 U.S. markets. In some cases, these studies were intended to identify video broadcasters that may be operating in BTA licensed ITFS channels. In other cases, they were intended to identify the local profile for systems operating in unlicensed frequency bands.
- For several mobile and wireless data operators, LCC has performed Collocation RFI analyses using Comsite Pro®. In many cases, LCC engineers performed on-site surveys prior to the analysis to identify all collocated equipment.
- For a mobile operator, LCC performed over 300 spectrum sweeps and interfer investigations across 40 BTAs.
- For a mobile operator, LCC performed EME Training for over 180 cell techs and engineers operating in multiple markets.
- LCC has performed over 700 MPE studies for several mobile operators. Many of these cases involved on-site RF measurements to fully characterize the emissions environment while others were based on RoofView® simulations.

The graphical representation of a RoofView® analysis.

LCC has the expertise and experience to address all of your Fixed Network Engineering needs.

Service Offerings Include:

- Transport Design
- Turnkey Microwave Services
- Network Optimization Services
- Circuit Provisioning & Testing Services
- Switch Support Services
- Network Database Services
- Network Inventory Services
- RF Testing & Measurement Services
- BSS Expansion & Integration Services
- Broadband Wireless Services
- IP Solutions

For more information on LCC and our Fixed Network Engineering services, please contact us at (703) 873.2000 or visit us on line at www.lcc.com.

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