

MANAGING ROOFTOP ANTENNAS SAFELY

Rooftop Antenna Management and RF Safety – What You Need to Know

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Most buildings today have some antennas on their rooftop. A potential source of revenue or tenant service, these antennas may pose a health risk to employees and be grounds for regulatory violations and penalties. Property managers and owners should give careful consideration to their rooftop antennas risk, as well as potential.

Introduction - Maximizing Rooftop Revenue - Safely

Proper placement and management of rooftop antennas is a significant incremental revenue source, with little additional costs. The right building with the right antenna can generate up to \$500,000 per year or more in revenue. As demand for wireless based technologies grows, the need for more rooftop placed antennas will continue.

This opportunity creates some issues and concerns for property owners and managers, such as: antenna client acquisition, placement, pricing and mix, ongoing antenna management, including periodic inspections, personnel training, billing and collections, as well as safety issues and regulatory compliance.

Although all of the above issues merit consideration, this article will focus primarily on RF Safety Risks and Regulatory Compliance. As all antennas emit non-ionizing radio frequency emissions which pose a potential health risk to personnel, several US regulatory bodies manage or monitor the placement and operation of antennas. The FCC, which primarily works with license holders, and OSHA, which monitors the workplaces where the antennas are situated, are two key entities.

In order to safely operate rooftop placed antennas, license holders and property managers / owners need to ensure equipment is properly installed and maintained, all relevant personnel are trained, and periodic inspections are conducted. Ensuring regulatory compliance, and avoiding potential fines or other legal actions, requires the additional steps of a written safety program, as well as proper documentation of inspections and training.

Rooftop Antenna Potential

Proper antenna selection and mix, along with placement and monitoring, can provide significant incremental revenue. Monthly rents from antennas can vary significantly, depending on the antenna type, configuration, location as well as local supply / demand fundamentals and negotiation savvy. This range can start in the low hundreds of dollars per month for a smaller community repeater, to several thousand for cellular, to even tens of thousands for broadcast antennas. In addition to the type and mix of antennas, the building rooftop size, configuration and engineering drive revenue potential from the rooftop.

Rooftop Antenna Issues

Placement of antennas on top of buildings can have some drawbacks. Building aesthetics and architecture can be comprised by the incorrect selection and placement of antennas. Also, antenna operation can interfere with other antennas, communications equipment or even building equipment, such as elevators.

In addition, radio frequency emissions (RF) from antennas pose health risks for personnel. Depending on the antenna frequency (See Exhibit 1 - Radiofrequency and Health Risks), thermal or athermal hazards can exist. Thermal hazards include shocks and burns, eye injury, developmental fetus impairment, immune system compromise, and neurologi-

cal or psychological problems. Athermal can cause internal body and organ damage due to heating, particularly cancer/leukemia, reproductive organ impact, T-Cell reduction as well as implanted device disruption. In addition to direct injury, secondary injury is a key risk - body overheating creating dizziness or other physical degradation which then leads to another injury, such as a fall.

Moreover, regulatory compliance failure carries risk with potential monetary and legal repercussions. FCC regulations apply to license holders and regulate the Maximum Permissible Exposure (MPE) allowed at different frequencies (See Exhibit 2 - FCC MPE). The FCC has established guidelines for trained and untrained or general population personnel, which provide a time limit of allowed exposure. Emission levels from an antenna can be determined mathematically, through a series of formulas, if certain information is available about the antenna in question, or through actual field measurements. The first technique is a good preliminary tool; however it is not as accurate as needed in actual field environments. Actual field measurements, using specialized equipment such as a RF Radiation Meter, provide true MPE levels, but take more effort and time, as well as specialized and expensive equipment. Effective September 2000, a key ruling has been in place which adopts and requires compliance for the MPE standards - "All existing transmitting facilities, operations and devices regulated by the Commission must be in compliance with the requirements...or, if not in compliance, file an Environmental Assessment..."

OSHA has adopted the FCC guidelines by reference and will enforce violations not against license holders, but against the controlling / host employer, which will often be the property owner or manager. Even if the property manager's direct employees are not involved, the manager will have responsibility for subcontractors, as the controlling / host employer. As the host employers, OSHA requires the employer to provide information about hazards, controls, safety and health



rules, and emergency procedures. OSHA also requires training under the general "right to know" requirement. In addition to specific MPE level, signage and training violations, OSHA can also issue a citation under the General Duty Clause (Section 5(a)(1) of the OSHA Act - "Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees."



Minimizing Risk and Maintaining Compliance

In order to minimize the risks of antenna rooftop property owners and managers can take several steps:

- ▲ **RF Safety Program** - A RF Safety Program is a critical first step to ensuring RF safety and regulatory compliance, comprised of 4 Key Elements - a Safety Policy, Safety Training, Safety Plan and Supervision and Enforcement.
- ▲ **Site Survey and Analysis** - An onsite physical survey of antennas and their emissions, leading to a document which inventories antennas, their characteristics and current RF emissions.
- ▲ **Personnel Training and Safety**
 - **Training Requirements** - Annual and ongoing training for new and existing personnel who may be exposed to RF emissions
 - **Record Keeping / OSHA Training Credit** - Proper record keeping of training, per OSHA standards, should be maintained, and OSHA Authorized Trainers should be employed who can provide OSHA Continuing Education Training Credit
 - **Personal Protective Equipment (PPE)** - RF monitoring and protective equipment can be used as an additional safety measure.
- ▲ **Signage** - Proper signage is required near and around RF emitting antennas; there are several levels of signage which need to be placed at the appropriate locations and distances.
- ▲ **Management Company Oversight** - A rooftop management company can be instrumental in helping to reduce RF antenna associated risks. Such companies will usually provide an initial assessment and ongoing periodic inspections, annual and as required personnel training, as well as marketing of the rooftop to carriers to maximize the rooftop revenue stream.

To Learn More –

To find out more information about safely managing your rooftop antenna, BOMA will conduct a Continuing Education Seminar in the Fall. - Stay tuned for more details from BOMA.

In addition, contact Altius Solutions, directly or visit the website at www.altiusolutions.com for more information.

About the Author

Adrian Sawczuk works as VP, Business Development, for Altius Solutions. He brings in-depth industry and business strategy experience, having worked as a strategy consultant for numerous Fortune 500 companies before joining Altius Solutions. Altius Solutions is an Atlanta-based rooftop antenna management company serving many of the large commercial property owners and managers.

Exhibits -

Exhibit 1 - Radiofrequency and Health Risks

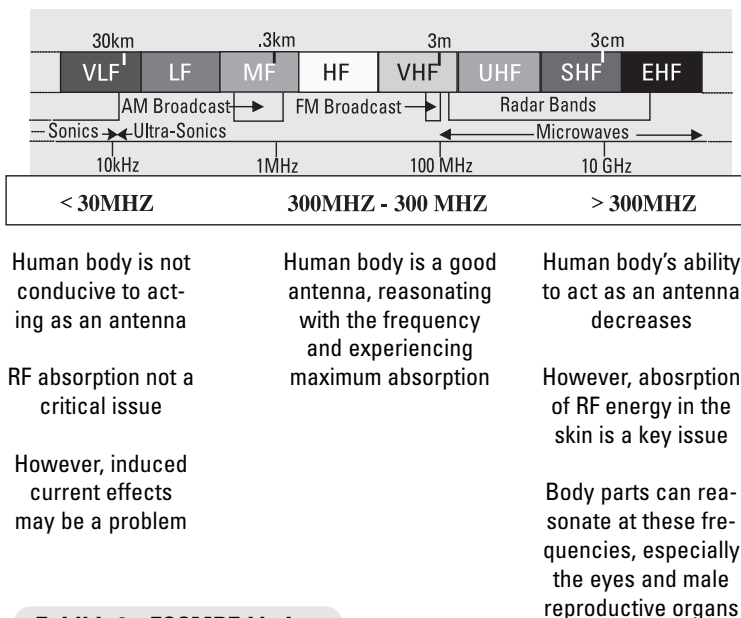
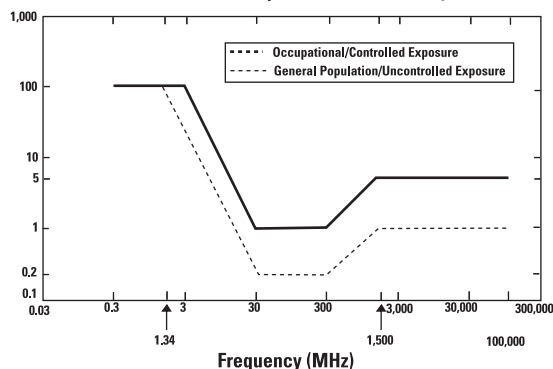


Exhibit 2 - FCCMPE Limitsz

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)
Plane-wave Equivalent Power Density



Signage

