



Are the antennas on your rooftop found money or an uninsured financial risk?

Co-Authored by Jeff Ebihara & Steve Baier-Anderson, P.E.

Executive Summary

The commercial property insurance industry helps building owners and managers contend with a wide range of risks related to the construction and use of their assets. Often, commercial general liability insurance is augmented with riders or re-insurance policies to protect against more costly risks such as lead paint, radon or asbestos. Building owners, their risk managers and site management companies might not realize that in recent years, commercial general liability policies have quietly excluded exposure to Electromagnetic Emissions (EME) created by the radiofrequency (RF) energy from wireless antennas deployed within or on top of a building.

According to A.M. Best Company, asbestos created an \$85 billion firestorm for the US property and casualty industry beginning in the 1980s with multi-generational claims still being filed today. Today, the commercial insurance industry has over \$23 billion in reserves for future claims (Lerner, Business Insurance) and asbestos has been called the worst occupational health hazard in US history. This experience impacts the industry's approach to other public concerns. Controversy continues around the effects of heavy, long-term cell phone use and in excluding RF exposure coverage, the insurance industry is ignoring common occupational workplace hazards that can be effectively and safely managed. Fair or not, rooftop antennas may represent a potential new risk of liability for building owners because of this action.

Building owners face a potentially catastrophic gap in their insurance coverage.



WATERFORD

Occupational EME Exposure on the Rise

Executive Summary Continued...

With the widespread deployment of wireless technologies since the mid-1990s, the number of rooftop antenna and in-building Distributed Antenna System (DAS) installations nationwide is growing exponentially as a result of consumer demand for faster, more robust mobile data. Because municipalities have encouraged wireless operators to utilize existing infrastructure for the placement of antennas, the installation of antennas has proven to be a significant source of lease revenue for building owners. However, the success of this relationship depends on property management professionals maintaining a safe environment for tenants, staff and contractors that may have access to the areas where antennas are located. Given the exclusion of this risk by insurance carriers, solutions to mitigate these liabilities are available and highly recommended.

Introduction

In the years following the breakup of the Bell System companies in 1984, two cellular licenses were awarded by the FCC in each market across the country for the initial deployment of “cellular” communications. Since that time, over 300,000 antenna locations have been deployed (Mobile Wireless Cell Sites, Statista), which conservatively includes over 75,000 rooftop locations on schools, hospitals, commercial buildings, multi-family rentals, condominiums, churches and universities to meet the public’s insatiable demand for mobile data. Adding to the growth of rooftop antenna installations has been the increase in “small cell” installations at lower heights, above ground-level, in order to address network capacity constraints. Small cell networks have made thousands of once overlooked, 2-3 story building rooftops now viable locations for antennas.

The prevalence of antennas on rooftops introduces a potential safety issue for every electrician, roofer, painter, HVAC technician, maintenance person, wireless carrier representative and leasing agent who accesses these rooftops. It is estimated that over 250,000 workers per year encounter RF antennas at job sites, according to A.M. Best in its February 11, 2013 briefing (Diadato, Best’s Briefing). While the FCC sets guidelines for human exposure limits and safety requirements and wireless service providers routinely evaluate their operations, many building owners believe compliance is the responsibility of someone else; the wireless service provider, the equipment manufacturer, the company installing the antennas or the site management company handling the leasing and installation coordination. In reality, all parties have exposure in a lawsuit, but the building owner may end up most accountable since building workplace safety is their responsibility, similar to historical asbestos claims.

The commercial insurance industry has chosen to exclude EME from most of its general liability policies. Whether this action is based on insurance underwriters perceiving that RF safety awareness is lacking in the industry among workers or linking emissions from mobile handheld devices with base station antennas, this poses a significant financial risk for the commercial real estate industry.

* Over 75,000 rooftop antenna installations nationwide

* Small cells make low-rise buildings attractive

* 250,000 workers per year encounter antennas at their job sites

What are Electromagnetic Emissions (EME)?

Radio Frequency Exposure

The FCC requires licensees to ensure new and existing wireless antenna sites do not expose people to hazardous levels of radio frequency (RF) electromagnetic emissions (EME). Wireless service providers (AT&T, Sprint, Verizon, T-Mobile, etc.) consider compliance with these rules when designing new transmitting sites or modifying existing operations that could change the RF environment where antennas are installed. The FCC rules set forth exposure limits, not emission limits. Industry practice is to mitigate accessible impacted areas with RF alerting signage and other conspicuous measures such as post and chain barriers or rooftop paint to provide notification of potential exposure hazards near antennas. This approach is intended to educate and deter access; building owners have a responsibility to ensure that workers permitted in these areas understand and follow this information.



Exposure limits and Ionizing vs. Non-Ionizing Radiation

The FCC rules (United States, Federal Communications Commission, Office of Engineering & Technology, OET 65) are based on exposure limits established by scientific and engineering organizations that review human health research in this field. At RF frequencies, the electromagnetic waves utilized by wireless antenna sites represent non-ionizing radiation which can be absorbed by the human body and lead to increased body temperature. The FCC limits include a 50-fold safety factor above exposure levels where adverse thermal effects may result. By contrast, the energy available in ionizing radiation (e.g. X-rays) is higher and can permanently damage tissue cells at the molecular level. Unlike ionizing radiation, exposure to non-ionizing radiation does not have cumulative effects. The FCC limits are based on the body's thermoregulation capabilities and are designed to prevent exposure to elevated RF energy levels for extended periods of time.

The FCC radiofrequency radiation exposure compliance requirements are set forth in 47 C.F.R. §§1.1307(b) and 1.1310. The limits are defined by maximum Specific Absorption Rate (SAR) values of the human body for two tiers of permissible exposure differentiated by the situation in which the exposure takes place and/or the status of the individuals who are subject to exposure. The first tier, General Population/Uncontrolled, exposure limits apply to those situations in which persons may not be aware of the presence of electromagnetic energy, where exposure is not employment-related, or where persons cannot exercise control over their exposure. Examples of this include walking on a sidewalk below a transmitting antenna or working in an office environment with rooftop antennas. Based on these criteria, the FCC limits for the General Population are associated with continuous safe exposure conditions.

What are the Exposure Limits?

The second tier, Occupational/Controlled, exposure limits apply to situations in which persons are exposed as a consequence of their employment, have been made fully aware of the potential for exposure, and can exercise control over their exposure. If building engineers, roofers, painters, leasing personnel and HVAC maintenance workers have not received RF safety training and are not equipped to monitor their exposure, then their ability to work in these environments should be restricted.

In general, wireless service providers proactively audit their own antenna and equipment installations, as well as evaluate, implement and maintain mitigation procedures. However, compliance requires consideration of all sources of EME and the resulting potential cumulative exposure to workers. With its knowledge of rooftop leasing activity, it is important for building management to be involved with the mitigation measures devised by wireless tenants, as well as develop and maintain a formal RF Safety Plan of its own. Building staff, maintenance workers and contractors should be made aware of the presence of transmitting antennas and the meaning of RF signage, barriers and markings. Training should be documented and maintained in personnel files. Work activities within these impacted regions require workers to have RF safety training and personal protection equipment to be able to monitor their exposure. Further, antenna locations and mitigation requirements should be maintained as reference when evaluating work plans and approving qualified contractors to work near antennas. Ensuring that people with access to areas near antennas understand the information and act in accordance with warning information will prevent exposure to hazardous levels of RF energy.

“Workers who have not received RF safety training... should be restricted”

What is the Risk?

Is my EME covered?

The commercial insurance industry has quietly excluded RF exposure from their liability policies. Referencing a 2013 report on emerging risks by the AM Best insurance rating agency, Gloria Vogel wrote for TalkMarkets in July 2017 (“A Coming Storm For Wireless”?) that in the interim, “global insurers have chosen to exclude RF coverage from their policies. The last global insurer to exit the RF exposure market was Lloyd’s of London in 2015”.

Exclusionary verbiage used in insurance policies to exclude RF coverage may read as such:

Electromagnetic fields

directly or indirectly arising out of, resulting from or contributed to by electromagnetic fields, electromagnetic radiation, electromagnetism, radio waves or noise.

Risk managers may not realize RF emission levels can be measured, monitored and mitigated. Guidelines for assessing and mitigating the potential for human radiofrequency exposure are outlined in the FCC Office of Engineering & Technology, Bulletin 65. Robust RF safety plan training and controls provide a means to address this potential liability. Lastly, with the current high volume of asset transactions in commercial real estate, it is likely EME compliance is overlooked during the purchase due diligence process as a result of the lack of real estate industry standard practices. Many REITs may be unknowingly purchasing risk-laden assets while taking time to test for other, well-documented hazards such as radon, lead and asbestos.

“The last global insurer to exit the RF exposure market was Lloyd’s of London in 2015”

-Gloria Vogel

Has This Happened to Anyone Else?

Successful Claims to Date

The most successful lawsuit to date involved AT&T in a July 2007 decision by the Alaska Supreme Court (Orchitt vs. AT&T Alascom, FindLaw's Supreme Court of Alaska Case and Opinions). In this case, the Alaska Supreme Court upheld the decision of the Alaska Workers' Compensation Board awarding an AT&T employee 100% temporary disability as a result of his exposure to radiofrequency emissions slightly above the FCC limits.

It is likely building owners will not be proactive addressing their EME risk until other, more costly claims are successful. However, awareness is growing among workers as antenna installations become more prolific with accompanying FCC signage and barriers. Workers may be confused and require training regarding the hazards of working near antennas with RF alerting signs, including areas near antennas where no signs are posted. An educated building manager with a RF Safety Plan is able to speak to these issues. When these matters are not proactively addressed, there may be significant liability concerns.

In the end, employers, wireless service providers, property management companies, rooftop leasing/management companies and equipment installation companies will all become part of the litigation. However, the defendant with the most financial exposure may very well be the asset owner who is collecting revenue from the antennas and responsible for rooftop access and safety.

“Alaska Supreme Court awards 100% temporary disability to AT&T employee.

How Do We Fix This?

Future Impact to the Wireless Industry

Wireless service providers, public safety, broadcasters, high-speed data providers and others with antenna placement needs, may find lease rates escalating once building owners better understand the risk they are assuming in exchange for rooftop rental fees. This will certainly be the case if building owners are unable to find liability coverage for EME exposure as part of their insurance policies. This might also impact the ability of wireless service providers to continue to deploy small cells at a pace to keep up with network demands in urban areas.

Our Recommendations

While the FCC outlines its compliance standards in OET 65, only the major wireless service providers appear to have processes and procedures in place to ensure those standards are being met. One of their biggest challenges is considering the cumulative RF environment that is created with other operators. As such, building owners and their representatives have the best awareness of wireless tenant activities.

After reviewing your General Liability Insurance Policy with respect to RF exposure in your workplace:

1. Perform an annual EME audit to ensure FCC compliance
2. Re-analyze and re-certify the rooftop every time a new tenant is added or a tenant changes antennas or power outputs
3. Develop and maintain a formal RF Safety Plan; provide EME safety training for employees and contractors who will be accessing the rooftop
4. Ensure appropriate signage, barriers and markings are installed and compliant and that tenants are not installing conflicting or non-compliant signage and barriers
5. Require the use of personal protective equipment, as required
6. Require an on-site EME audit as part of the purchase due diligence process

Will This Always be the Case?

Conclusion

The demand for wireless services only continues to grow. In its November 2017 Mobility Report (“Mobile Data Traffic Growth Outlook – Ericsson.”), equipment manufacturer Ericsson noted, “North America has the highest usage, and traffic is expected to reach 7.1 GigaBytes (GB) per month per smartphone by the end of the year and increase to 48GB by the end of 2023”. The report goes on to estimate a global compound annual growth rate of 42%!

Building owners, especially those in urban and near suburban areas will continue to enjoy significant rooftop leasing opportunities for their assets. The continued deployment of small cells will only increase demand for 2-3 story buildings that were previously overlooked by wireless carriers deploying larger, macro sites. The next generation of wireless, 5G is already being deployed using small cells and will provide faster data speeds (up to 20 Gigabits per second) and more reliable service.

However, building owners should be vigilant in managing their risk by verifying appropriate insurance coverages, provide appropriate training and put RF safety plans in place to ensure a safe work environment for tenants, employees and others in their building.



About the Authors

Jeff Ebihara

Jeffrey Ebihara is President of EbiCo Group LLC, dba Rize Solutions, a certified Minority Business Enterprise project management and technical solutions consulting firm. Mr. Ebihara has the unique background of having worked as a commercial property manager for Trammell Crow Company in Dallas, TX, was a licensed insurance agent in Michigan and has served in an executive leadership capacity over 20 years in the wireless telecommunications industry with such companies as BellSouth, AT&T, American Tower and Network Building + Consulting. Rize Solutions currently provides consulting services to Waterford Consultants.

Steve Baier-Anderson, P.E.

Steve Baier-Anderson has worked in the wireless industry since 1990 as an engineering consultant and cellular network engineer. Prior to his leadership role as Vice President of Engineering for Waterford, Mr. Baier-Anderson held key roles in the design, deployment and optimization of 2G, 3G, and 4G technologies in the Mid-Atlantic region for Verizon Wireless. He holds a BS in Electrical Engineering from the University of Maine and an MS in Systems Engineering from Johns Hopkins University.



WATERFORD

About Waterford

Waterford Consultants was founded in 2004 and is a professional services organization specializing in FCC and FAA regulatory compliance, engineering, site development, and a host of software-related offerings that service the wireless industry.

Waterford specializes in a diverse collection of technical and consulting services that continue to expand with significant focus given to utilizing the most innovative and tech-savvy solutions. Waterford's clientele consists of the industry's leading carriers, tower and structure owners, engineering and site acquisition firms, as well as most local, state and federal government organizations.

Contact Waterford

Thomas W. Ferguson

President/CEO

tferguson@waterfordconsultants.com

703.596.1022

Steve Baier-Anderson, P.E.

Vice President of Engineering

sbaieranderson@waterfordconsultants.com

703.596.1022, ext. 128

www.waterfordconsultants.com



Works Cited

Diodato, Anthony. “Best’s Briefing.’ .” Ambest.com, www.ambest.com/directories/bestconnect/EmergingRisks.pdf.

“Electromagnetic Field Insurance Policy Exclusions.’ .” Entrust.org, ehtrust.org/key-issues/electromagnetic-field-insurance-policy-exclusions/.

“FindLaw’s Supreme Court of Alaska Case and Opinions.’ .” [Http://Caselaw.findlaw.com](http://Caselaw.findlaw.com), Supreme Court of Alaska, 6 July 2007, caselaw.findlaw.com/ak-supreme-court/1092191.html.

Lerner, Matthew. “Outstanding Asbestos Claims Drag on Insurance Industry Earnings.” Business Insurance, 1 Feb. 2015, www.businessinsurance.com/article/00010101/NEWS06/150139968/Outstanding-asbestos-claims-drag-on-insurance-industry-earnings.

“Mobile Data Traffic Growth Outlook – Ericsson.’ .” Ericsson.com, 9 Nov. 2017, www.ericsson.com/en/mobility-report/reports/november-2017/mobile-data-traffic-growth-outlook.

“Mobile Wireless Cell Sites in the U.S. 2000-2016 | Statistic.” Statista.com, Sept. 2017, www.statista.com/statistics/185854/monthly-number-of-cell-sites-in-the-united-states-since-june-1986/.

United States, Congress, Engineering & Technology. “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.” “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.,” 1997. transition.fcc.gov/bureaus/oet/info/documents/bulletins/oet65/oet65.pdf.

Vogel, Gloria. “A Coming Storm For Wireless?’ .” TalkMarkets - Content, 27 July 2017, www.talkmarkets.com/content/stocks—equities/a-coming-storm-for-wireless?post=143501.