PPI Consulting, LLC

The Commissioners
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Mesdames and Sir:

Please accept my comments on the FCC's Further Notice of Proposed Rule Making ET Docket Number 13-84.

§109 notes that comments that have a cost/benefit component will be taken more seriously by the Commission. If serious structural changes that result in effective RF safety for all workers are not made, the cost/benefit comments that you seek in this proceeding will have no effect in preventing unnecessary third-party worker injuries by RF radiation nor of averting what I and others perceive as significant insurance claims and potential litigation cost involving hundreds of thousands (if not more) of potential claimants.

I have been a consultant to the insurance industry for the last thirty years, and my clients are, to say the least, alarmed about this situation.

To understand the magnitude of this issue, please consider the following:

- **RF radiation from transmitting antennas is a long-standing, recognized human-health hazard by the FCC;**
- **RF radiation is no ordinary hazard as it is tasteless, odorless and invisible,**
  - **Commercial Wireless Service Provider (CWSP) workers and contractors are RF-trained and receive the benefits of foreknowledge of the antennas' locations and even power-downs when in proximity;**
  - **Third party workers are more often than not, unaware of its presence;**
  - **This two-tiered system ought to be a red flag to the regulators as it is to the insurers;**
  - **In addition to thermal injuries, cognitive and psychological difficulties can result from over-exposure;**
- **Unsuspecting building and maintenance workers have the ability to gain close proximity to RF antennas: insurers estimate in the thousands on a daily basis;**
- **The duration of these occurrences of working in close proximity to RF transmitting antennas spans years and perhaps decades in some cases;**
- **There has been a complete lack of FCC oversight and enforcement;**
- **The appearance of blatant disregard for the law by the FCC licensees who have knowledge of the RF hazards and are required by law to ensure that no one, regardless of employment, is over-exposed to RF radiation.**
- **All of this could cost the insurance industry hundreds of millions of dollars in liability, workers compensation, health care and other claims.**

It seems that this issue has reached a boiling point; as a father, husband and citizen of the United States, I could not be more alarmed by and disappointed in the governmental agencies responsible for enforcing the existing RF human-exposure regulations. This is coupled with a seeming lack of moral and ethical corporate responsibilities of the so-called commercial wireless service providers who appear to be putting huge profits in front of worker safety.

THE FCC's CHALLENGES

It is a clear, published, scientific fact that RF radiation from transmitting antennas is a recognized human-health hazard. The latest RF safety standard was developed by ANSI/IEEE in 1996 and was adopted by the FCC in 1997. This was a time when the vast majority, if not all, of these antennas were placed on discreet towers behind locked chain-link fences and inaccessible to anyone other than authorized personnel. Now the antennas are largely placed on the roofs and fasciae of buildings, in church steeples and other places accessible in the normal course of business to untrained third-party workers including roofers, painters, HVAC engineers, maintenance crews and first responders to name a few.

The FCC's primary requirement dealing with human RF exposure can be found in Part One of Rules 47CFR 1.1310 which delineates the allowable human-exposure limits in terms of frequency, field strength, power density and averaging time. However, in reality, there is no practical application of this standard to ensure that no person is exposed to RF radiation above the FCC's allowable limits.

The table reproduced below is the referenced standard and applies to RF-knowledgeable workers referred to as Occupational Workers as well as to non-RF-knowledgeable workers which are noted as the General Population Workers. An example of an Occupational Worker would be an employee of Sprint, Verizon, AT&T or other service provider who has knowledge of RF hazards, while a General Population Worker could be described as a painter, roofer, electrician, etc. who has no knowledge of the hazards of RF radiation and more often than not, may not even be aware what an antenna looks like.

The FCC allows Occupational Workers to be exposed at higher levels of RF radiation than those of the General Population Workers, thus the table has two parts (A & B). As best as I can tell, the FCC expects either that the General Population Worker would somehow know the existence of allowable RF exposure limits, the frequency range of each of the antennas they are near, and be able to determine how many mW/cm^2 of exposure are allowable in the time period allotted!

Therefore, if the person knew of the table and in addition was told by someone (e.g. the FCC licensee[s] whose antennas they are working near) the frequency ranges of the antenna[s] at the particular site, somehow, mirabile dictu, he or she would know the safe distance away from the antenna[s] thereby remaining within the published FCC safety limits!

I am a reasonably intelligent college graduate and can only tell you that as a non-expert, I see no practical application of the FCC's allowable RF exposure distance limits that could result in providing even a modicum of RF safety. Admittedly, the General Population Worker could employ a $20,000 RF exposure measurement wand and determine the power-density for an area in front of an antenna to ensure compliance with the FCC RF exposure limits, however, I seriously doubt that most painting, roofing, HVAC etc. companies could afford such devices nor have the technical knowledge to use them.

So I contend that, although the FCC has clear RF human-exposure limits and guidelines, there is no way evident to protect from over-exposure, the thousands of third-party workers who, by virtue of their employment, come in close proximity to these antennas.

§1.1310 RADIOFREQUENCY RADIATION EXPOSURE LIMITS

The criteria listed in Table One shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter. Further information on evaluating compliance with these limits can be found in the FCC's OST/OET Bulletin Number 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation."

Note to Introductory Paragraph: THESE LIMITS ARE GENERALLY BASED ON RECOMMENDED EXPOSURE GUIDELINES PUBLISHED BY THE NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS (NCRP) IN "BIOLOGICAL EFFECTS AND EXPOSURE CRITERIA FOR RADIOFREQUENCY ELECTROMAGNETIC FIELDS," NCRP REPORT NO. 86, SECTIONS 17.4 .1, 17.4.1.1, 17.4.2 AND 17.4.3. COPYRIGHT NCRP, 1986, BETHESDA, MARYLAND 20814. IN THE FREQUENCY RANGE FROM 100 MHZ TO 1500 MHZ, EXPOSURE LIMITS FOR FIELD STRENGTH AND POWER DENSITY ARE ALSO GENERALLY BASED ON GUIDELINES RECOMMENDED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) IN SECTION 4.1 OF "IEEE STANDARD FOR SAFETY LEVELS WITH RESPECT TO HUMAN EXPOSURE TO RADIO FREQUENCY ELECTROMAGNETIC FIELDS, 3 KHZ TO 300 GHZ," ANSI/IEEE C95.1-1992, COPYRIGHT 1992 BY THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., NEW YORK, NEW YORK 10017.

Table 1—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	**Electric field strength (V/m)**	**Magnetic field strength (A/m)**	**Power density (mW/cm2)**	**Averaging time (minutes)**
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30
f = frequency in MHz				
* = Plane-wave equivalent power density				
Note 1 to Table 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment, provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply, provided he or she is made aware of the potential for exposure.				
Note 2 to Table 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.				

THE INSURANCE INDUSTRY AND THE EMERGING RISK

The growing awareness and concern regarding workers being over-exposed to RF radiation from wireless antennas is real. AM Best, the premier insurance rating agency, recently identified Radio Frequency (sic) from cell phone transmitting antennas as an "Emerging Technology-Based Risk" (see below). AM Best estimates that approximately 250,000 workers per year come in unwitting close contact with these antennas. Also and significantly, they point out that the workers from the commercial wireless service providers are well-trained on and protected from the potential dangers of RF radiation while others are not.

The AM Best article notes that the commercial wireless service providers train their workers on the potential of RF radiation hazards, and from conversations that I and some of my clients have had with former employees of Verizon and Sprint knowledgeable on RF and the situation, they often turn off the antenna power when their workers are in close proximity to the antennas. However, it appears that virtually no protections are offered to non-FCC-licensee workers.

BEST'S BRIEFING

February 14, 2013, U.S. Property/Casualty & Life/Health

Emerging Technologies Pose Significant Risks with Possible Long-Tail Losses

The insurance industry faces a constantly escalating level of exposure from rapidly developing technologies with risks that are not well understood. In many situations, the science associated with understanding these new risks is in the early stages of development.

A.M. Best believes that it is critical for insurers to maintain vigilant oversight of emerging technologies as a critical component of their enterprise risk management system. Effective enterprise risk management encompasses identifying, evaluating and addressing risks that could threaten the earnings or viability of an insurer. This includes a prospective look at the underwriting exposures so that changes to policy language or underwriting criteria can properly manage losses from these new risks. An exposure which may present only insignificant insured losses at present, may bring future unprecedented losses.

None of the current emerging technologies appears to be the next asbestos, the longest running and most expensive tort in U.S. history, according to the Rand Institute. Asbestos in many ways presented the "perfect storm" of loss characteristics: extreme toxicity; a very lengthy latency period before emergence of illness; a contagion capability through airborne transmission and physical contact; and lengthy exposure to a very large number of workers, their family members and asbestos product users.

A.M. Best recently estimated the U.S. property/casualty industry's ultimate asbestos losses at $85 billion. While losses from emerging technologies may pale in comparison, they still could be extremely significant to the industry. Insurers need to monitor the manner in which emerging technologies are, or are likely to be, deployed; the risks associated with their use; their residual or unintended impacts; and the manner in which the insurance policies may be called upon to cover losses.

BEST'S BRIEFING (cont'd)

Emerging Technology-Based Risks

RF (Radio Frequency) Radiation Risk – Today there are more than 600,000 cell sites in the United States and that number is expected to grow with the demand for faster, more reliable wireless devices. The risks associated with long term use of cell phones, although much studied over the past 10 years, remains unclear. Dangers to the estimated 250,000 workers per year who come in close contact with cell phone antennas, however, are now more clearly established. Thermal effects of the cellular antennas, which act at close range essentially as open microwave ovens can include eye damage, sterility and cognitive impairments. While workers of cellular companies are well trained on the potential dangers, other workers exposed to the antennas are often unaware of the health risks. The continued exponential growth of cellular towers will significantly increase exposure to these workers and others coming into close contact with high-energy cell phone antenna radiation.

WHAT DO THE FCC LICENSEES TELL THE PROPERTY OWNERS WHO LEASE THEM SPACE FOR THEIR ANTENNAS ABOUT THE HAZARDS OF THE ANTENNAS?

Based on a recent article in *Claims Journal* by the insurance equity analyst, Gloria Vogel, it appears that the commercial wireless service providers are being deceptive or at best, disingenuous to the landlords from whom they lease space for their antennas. In the monograph, "Hidden Insurance Risk Lurks in Property Leases," (see below) Ms. Vogel notes several items disturbing to the insurance industry and in need of the Commissioners' attention, namely that the FCC licensees (Commercial Wireless Service Providers) do not tell the landlords about the risks/hazards of RF radiation from their antennas and the fact that they can cause injury to people coming near them. She states that the FCC licensees are the technical experts on the issue who employ, train and protect hundreds of RF engineers and as such have a "duty to warn" the property owners of the inherent dangers associated with their antennas.

It is clear that if landlords knew the hazards associated with the RF radiation from the CWSP's antennas that they would be less likely to sign such leases and thus may have legal recourse under failure to warn, fraud and other legal theories.

Ms. Vogel concludes that as soon as the unsuspecting workers, who may have been over-exposed to RF radiation from CWSP antennas, recognize that they have been injured, there will be thousands of claims filed in a manner similar to those which evolved in the asbestos debacle.

CLAIMS JOURNAL

Hidden Insurance Risk Lurks in Property Leases

By Gloria Vogel, CFA | August 21, 2013

The RF Radiation Risk Factor

In February 2013, AM Best classified RF (radio frequency) radiation from wireless antennas as an "Emerging Technology-Based Risk." This was based, in part, on an estimated 250,000 workers per year who may be over-exposed to RF radiation from the 600,000 governmental and commercial RF radiating antenna systems across the nation.

The FCC recognizes RF radiation from transmitting antennas as a human health hazard, as a single RF transmitting antenna can emit hundreds of times more RF radiation than a cell phone. RF radiation hazards from transmitting antennas can cause thermal and non-thermal or cognitive/psychological injuries. Non-thermal or cognitive/psychological injuries do not necessarily have a physical manifestation. Cognitive/psychological RF injuries include memory loss, mood disorders, sleep disorders, and impaired or diminished cognitive function.

RF radiation injuries should be of concern to insurers, especially since their exposure to the risk is hidden within the lease contracts between the commercial wireless service providers (CWSPs) and landlords who lease space to those CWSPs for antenna systems.

The Property Leases:

Landlords who lease space to the CWSPs are completely unaware of the potential for injury from RF transmitting antennas and that they will be held liable for such injures. Typical site leases include a mutual indemnification clause, which would appear to protect the landlords from personal injuries that may be caused by the CWSPs' antennas. However to enforce the indemnity provision, the landlords must demonstrate that the primary cause of injury was the fault of the CWSPs.

CWSPs will take the position that it was the landlords who permitted access to the RF hazard area near the antennas, which was the proximate cause of the injury; or, that injury could have been prevented by the landlords controlling access to the RF hazard areas. So, in reality, the lease language indemnity provision merely buys the landlords and their insurers a lawsuit against well-financed CWSPs with a litany of possible legal defenses.

Who Has Liability for RF injuries?

The CWSPs employ hundreds of RF engineers and are the technical experts on anything involving RF radiation and its ability to cause injury to humans. Accordingly, prior to the lease being signed, the CWSPs have a "Duty to Warn" the unsuspecting landlords, and their insurers, of the RF radiation hazards associated with the lessee's equipment.

By not divulging pertinent RF hazard information in the leases, the CWSPs may be attempting to use the 1996 Telecom Act as a shield in not warning the landlords. The Act precludes any discussion of RF radiation at municipal siting hearings. However, there is nothing contained in the language that enjoins the CWSPs from not informing the landlords of the hazards associated with RF radiation in the lease agreements they unilaterally create. Their actions are based solely on a business decision that has been used by other industries in the past…never mention the physical harm to humans that the product produces.

A landlord with full knowledge of their financial exposure to the liability assumed with the lease would likely either demand a greater monthly fee, or would decline permission to site on their property. It stands to reason that no business person would trade hundreds of thousands or more in attorney and legal fees associated with an RF injury, for a few thousand dollars of rental income per month.

Legal Recourse

Once a lease has been executed without proper disclosure, "Fraud in the Inducement" can be alleged by the landlord asserting that the CWSP concealed material facts associated with the hazards of their operations/equipment. The CWSP will have known at the time of negotiating the contract that by not disclosing those material facts, the landlord might be more inclined to sign the lease. Additionally, theories of "Intentional and Negligent Misrepresentation of Material Facts" may be brought against the CWSP.

Finally, there will be insistence that the CWSP has a "Non-Delegable Duty" to ensure full compliance with the FCC RF human exposure standard. Federal law, 47 CFR 1.130, establishes the FCC licensee's (CWSP) duty regarding RF safety, which cannot be transferred to the landlord.

Lack of Claims Doesn't Mean Lack of Claimants

The insurers should not rely on the lack of RF injury claims to proclaim there isn't a significant RF injury problem with workers being exposed to RF radiation on a daily basis. The lack of claims is the result of injured parties being unaware that they were over-exposed to RF radiation. Just one plaintiff's attorney with an aggressive media campaign can quickly alter this lack of knowledge. As the population of workers becomes aware of the hidden RF hazards and their potential for exposure, claims will likely be filed by the thousands, and long term litigation will result, in similar manner to the way asbestos evolved.

Gloria Vogel is senior vice president at N.Y.-based Drexel Hamilton, a service disabled veteran broker-dealer. She also teaches finance and metrics to graduate students as an adjunct professor at NYU-SCPS. Previously, Vogel was a contributing author on www.seekingalpha.com. She worked at Swiss Re and was an All-Star equity research insurance analyst at several major investment banks, including Lehman Brothers and Bear Stearns.

WHAT ELSE MIGHT THE FCC LICENSEES NOT BE TELLING THE PROPERTY OWNERS?

One of my clients was provided a "Dear Landlord" letter (see below) that Verizon sent to a building owner who leases space on his roof for RF antennas. That letter, I am told, appears to be in clear violation of the FCC RF Rule § 1.1307(b). The licensee is responsible for the FCC RF Human Exposure Regulations, not the property owner. The licensees are the technical experts on RF; however, in this case it appears that Verizon is telling this property owner that it is he who is responsible for RF safety and FCC compliance. Verizon herein states that the property owner is responsible for signage, controlling access and the training of individuals which appears to be a blatant violation of their FCC license agreement.

"DEAR LANDLORD LETTER"

May 1, 2013
XXXXXXX XXXXX LLC
XXXXXXXXXX

RE: XXXXXXXX (cell site located at XXXXXXXXXXXXXX)

Dear Property Manager,

The Federal Communications Commission (FCC) OET Bulletin 65, Edition 97-01 dated August 1997 outlines requirements for radio frequency exposure and provides guidelines for determining whether proposed or existing transmitting facilities, operations or devices comply with the limits for radio frequency exposure. Compliance with FCC requirements governing RF emissions is a shared responsibility between transmitter/antenna owners and the owner/landlord of the site.

Verizon Wireless recently performed an analysis of the above-noted site's compliance with the FCC requirements. The results of this analysis indicate that the following steps must be taken in order to maintain compliance with the FCC requirements at this site:

1. Post Appropriate Notification Signs;
2. Establish a controlled area within close proximity to our antennas by installing a restrictive barrier as noted on the attached diagram.
3. Ensure that all personnel permitted access to controlled areas are properly trained and authorized.

If for any reason a person from your staff or outside contractor should require access in close proximity to any Verizon Wireless antenna please contact XXXXXXXXXXXXXX in advance, so we can make the appropriate arrangements.
A controlled area involves restricting access to only properly trained and authorized individuals through the use of physical barriers and/or administrative controls. All individuals authorized to enter a controlled area must be trained in RF Safety. The responsibility of restricting access to controlled areas and ensuring proper training of those granted access lies with you as the landlord or site management group of the facility. Verizon Wireless can assist in identifying companies that provide RF Safety related services should you need assistance in educating your employees, implementing an RF Safety program and/or training those who require access to a controlled area.
Verizon Wireless is committed to compliance with all government regulations and standards. Please contact Verizon Wireless if you have any questions regarding this matter.

Sincerely,
Verizon Wireless
XXXXXXXXXXXXX

This letter, which I infer is not unique either to Verizon or to this property owner, puts a fine point on just how out-of-control this problem is. The FCC licensee is clearly responsible for the RF hazard it creates, but is blatantly trying to obfuscate the issue and to pass off their RF responsibility to an unsuspecting property owner.

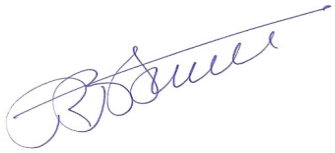
Are all of the CWSP's, who, according to FCC rules are responsible for RF safety doing the same thing to unsuspecting landlords? The evidence suggests that these letters are not going to large property owners and managers who have sophisticated legal teams in place.

CONCLUSION:

The evidence is overwhelming that the current state of the RF safety for third-party workers and compliance with FCC regulations is abysmal and that a comprehensive industry-wide (including property owners, CWSP's, workers' groups and unions and all of their insurers) RF safety and training system must be put into place.

As the main regulatory agency involved, it is the FCC's responsibility to ensure that an effective (and that includes cost-effective) RF safety system be implemented. I trust that you will take appropriate action so that the thousands of injuries from RF antennas will end.

Sincerely



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