

Infrastructure, regulatory and financial information for the antenna-siting community

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OCTOBER 2007

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from safety to specs

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PCIA - The Wireless Infrastructure Association
SWAP - State Wireless Association Program

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A solid-round self-supporting tower with flanged joints extends 390 feet above ground level in West Palm Beach, FL. The tower, manufactured by Allstate Tower for Southeastern Communication Service, was erected in the summer of 2006 to replace three towers destroyed by Hurricane Wilma in late 2005.

Photo illustration by Scott Dolash.

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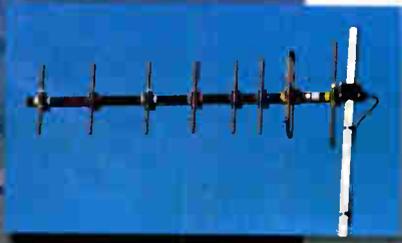
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Beginning on page 40, this issue's regulatory focus turns to antenna-structure standards, particularly the new TIA-222-G specs. Professional engineer **Ed Gazzola** discusses how standards become regulatory concerns as they are incorporated—or not—into state and local codes. Ed has been with Atlanta-based consulting engineers Morrison Hershfield for over 20 years, serving as firm president since 1998. He has an MS in Structural Engineering and is also a past-chair and member of several technical standards committees. In addition to facilities, network and outside plant engineering, Morrison Hershfield's tower services include analysis, design, inspection and turnkey tower upgrades. The firm has completed more than 10,000 tower analyses, designs and inspections on six continents over its 60-year history.

Minimizing costs associated with WiMAX backhaul by reducing antenna size and extending antenna structures is discussed by contributor **Greg Friesen** beginning on page 48. Greg is director of Product Management for Ottawa, Ontario-based DragonWave, which provides carrier-grade microwave equipment enabling high-capacity broadband wireless systems for network operators and service providers. Greg's experience ranges from operations and CAPEX modeling and network architecture design to site and link engineering. He has a BS in electrical engineering from the University of Saskatchewan.



Tower owners and potential tenants sometimes need a matchmaker. Beginning on page 45, **Adam Rogers** discusses how AWS providers that might be insubstantial tenants individually (compared to a cellular carrier) can be grouped by an intermediary and collocated onto a multi-tenant platform. Adam is vice president for Business Development for Hoboken, NJ-based network-integration firm Core180. Adam's 12 years' experience in telecom includes operational support-systems implementation for major telecom providers. He worked with Internet infrastructure and Voice Over IP evaluation and testing. Adam has a BS in accounting from Florida State University and an MBA from the University of Florida.

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Tricky Mickey

Twice a year, I take stock of the industry: at the beginning of each year, and at the PCIA show—and during the time leading up to them.

This is a good time to be in the industry. Demand is through the roof; technologies are exploding; and demand for coverage, capacity and services are putting pressure on us to provide unique and innovative solutions. In my home area, DC, capacity remaining for rental



on most tower sites is quickly heading for a “No Room At the Inn” sign. New entrants, merging entrants and the anticipated demand from 700 MHz and the Advanced Wireless Service operators only point in one direction.

TerreStar, Mobile Satellite Ventures and others are a little further away, in most markets, but they coming down the pike too. I’ll risk sounding like a broken record, but I am seeing more of a dichotomy beginning to be set up in the industry. The density of deployment for Wi-Fi—yes, I know: If you can take

managed communications sites.

Higher-end networks such as TerreStar and some 700 MHz entrants, the traditional PCS and cellular carriers, and public-safety systems, along with aggregated backhaul providers, will only drive the robustness, security and demand for services to a higher plateau at our more traditional cell sites. Get ready.

I’ve been in the business since high school. I accompanied my father, checking out cell sites back in 1983, at the beginning of the cellular industry. One side of the business I’m still surprised is as inconsistently managed as it appears to be is rooftops. There are some good management companies, and there are some good rooftop owners, but for the most part, rooftops are a mess. Hardly anyone knows what is on them, and the infrastructure is haphazard, at best. I’m going to keep an eye on this side of the industry to see how some of the increased pressures for reliability and back-up systems affected rooftop management. The demand for rooftops is going to greatly increase. This would appear to be a good time to sort out the issues of control, capital improvements, pay-back periods and regulation.

The PCIA show is here. I just love it. A show dedicated to the industry, without the fluff. At the other big spring show, we siting industry folks get lost. Definitely not

at PCIA. Keep an eye on the State Wireless Association Program (SWAP) folks—a fast-moving groundswell of intelligent people. Make sure to say hi at PCIA — I have cut my hair since the photo on this page was taken, so read the name tags of people you walk by. We’ll have the Biby Publishing booth set up; stop by and give us some idea of how you think we are doing, and what else we can cover for you. **agl**

Demand is through the roof; technologies are exploding; and demand for coverage, capacity and services are putting pressure on us to provide unique and innovative solutions.

these guys seriously—WiMAX, and some cellular networks is clearly so dense, requiring so many sites, that our traditional business models may not work well. Density to get coverage and capacity will drive sites downward in height and on to structures we’ve traditionally not thought of as professionally

by Rich Biby, Publisher
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Up the tubes

When is a park bench like a cell tower? When it's made of concrete.

A fiber concrete developed for bridges and adapted for furniture, such as curved park benches, serves as construction material for a new cell-site design called the tower tube. Working with engineers at Ericsson, Swedish architect

Thomas Sandell designed several versions of monopoles using the fiber concrete. Sandell has designed buildings, interiors and furniture for Ericsson, IKEA, Cappellini and Net Zero, among others. He is known as a modernist architect. His



swept and spiraled tower tubes represent some of the most artistic designs since Hank McGinnis' Adelphi or Landmark tower—not counting disguised and concealed antenna sites, some of which also are works of art.

My first thought when I saw the tower design was to wonder what it would be like to work on base station equipment and antennas enclosed in a narrow tube that admits hardly any outside light. It turns out that the base station equipment is first installed at ground level where the wide tower base offers a bigger volume in which to work. The base of the tower flares out in a shape reminiscent of an early manned space capsule. The base station equipment then is raised to the top of the tube by an elevator.

Workers gain access to elevations within the tube by a ladder. I can't be sure of the safety implications of the arrangement, but they appear to be good. A tower hand at the NATE convention told me that one reason he enjoyed his work was the views from towers. With the tower tube, that perk

would come to an end.

Local jurisdictions that wrangle over whether towers should be sky-blue or gray or mottled in some kind of camouflage pattern can be addressed with the new concrete, which accepts color, texture and shaping. I know from examples provided by the manufacturer what shapes the architect has in mind so far. Once a committee gets a hold of the controls, it will be interesting to see what twists a tower tube might take. A twist, or spiral, happens to be one of the designs that Sandell has offered in the visual representations of the possible tower-tube configurations.

Although the concrete protects the base station equipment from vandalism and a weatherproof enclosure protects the antennas, no design is without its disadvantages. A pristine

concrete obelisk could prove mighty tempting to graffiti vandals. By enclosing the base station equipment, the tower tube may reduce the cell-site footprint compared to a fenced compound enclosing the foundations of self-supporting steel towers and the equipment shelters or ground-mounted cabinets that accompany them. Security concerns at some locations might require a perimeter fence, anyway.

Lightning might be less of a problem, as the embedded steel reinforcement cables and the foundation provide a conductive path for surge current within the skin of the tube. Cooling the air inside the tube is said to be somewhat more efficient because of the convection current in the elongated air chamber.

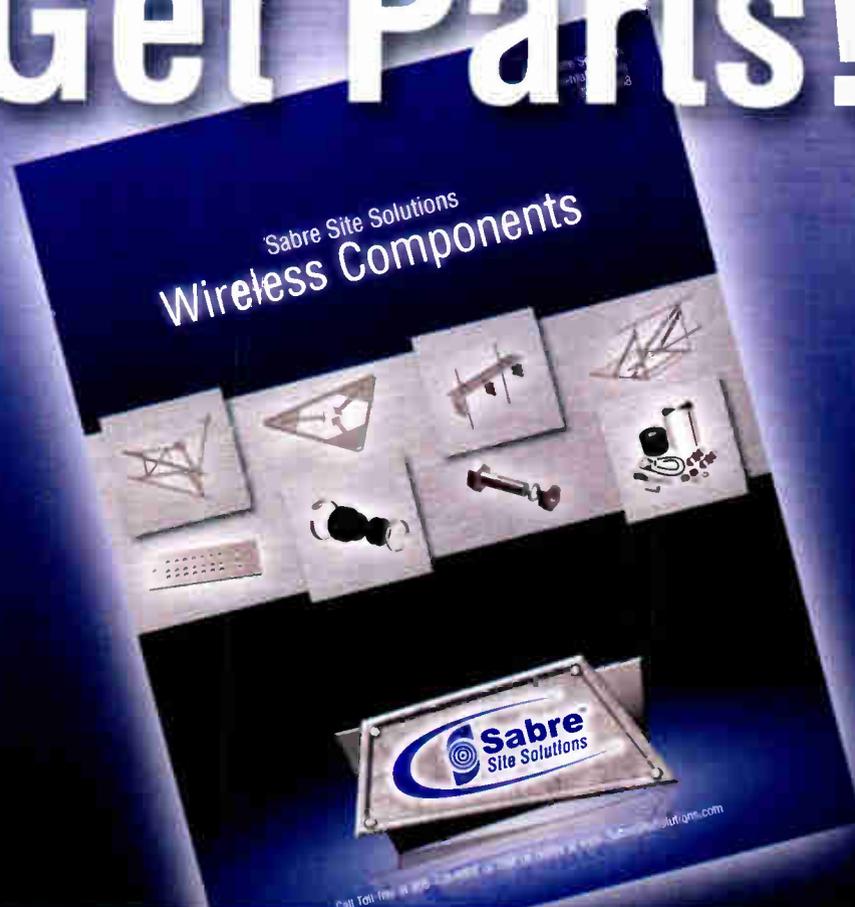
Innovation comes in many forms. This month, it arrived as a tower tube. **agl**



Ericsson regards its tower tube as a sleek, architecturally designed, aesthetically pleasing tower. 'It can be regarded as a feature of any landscape,' a statement from the company reads. The fiber concrete can be shaped, textured and colored to blend in or to stand as an artistic object. Swedish modernist architect Thomas Sandell has designed several versions of the monopole.

by Don Bishop, Exec. Editor
dbishop@agl-mag.com

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Industry Advocacy and the Future

by the PCIA staff

One of the most important roles of PCIA as the Wireless Infrastructure Industry Association is to present industry interests to governments that regulate it. That is especially critical because there are so many different levels and types of regulation. At the federal level, FCC, FAA, EPA and OSHA, among others, play a role. At the local level, a myriad of agencies have jurisdiction over zoning and land use. State legislatures also make important decisions that affect the industry.

PCIA and its predecessor associations have been effective advocates for the wireless industry since the 1940s. The issues and industry participants have changed, but our principles remain the same: wireless services are critical; government needs to make necessary spectrum available; and regulation should be strictly limited to that which is reasonable and necessary.

The wireless infrastructure industry has grown, matured and demonstrated the vital role that it plays in the expansion of wireless services. New wireless services continue to be developed, aided by large amounts of spectrum made available in FCC auctions. There are still critical regulatory challenges for the industry, and PCIA is addressing those issues at all regulatory levels.

At the federal level, PCIA submitted

a detailed documentation of the disastrous, unintended consequences of the FCC's post-Katrina rules mandating back up power at all cell sites and installations. We also continue to press the FCC and FAA to modernize and simplify their rules that affect the industry.

At the state level, PCIA works with legislatures to create a streamlined process for siting. In the last year, legislation was enacted in California, and a bill is awaiting the governor's signature in North Carolina as this article goes to press. Legislation has dramatically improved the situation for the industry in a number of states, so state legislation will continue to be a high priority for PCIA.

At the local level, PCIA has engaged with jurisdictions regarding counter-productive approaches to the siting process. We have been successful in making some understand that their approaches would hurt their citizens by making service improvements impossible. In some cases, we have been able to persuade them that their approach would violate the Telecommunications Act, and they have restarted their process to work cooperatively with industry representatives. In other cases, court action has been necessary. For example, federal courts struck down a San Diego County restrictive ordinance on appeal by PCIA members—with the support of a PCIA brief.

An important part of our advocacy work is educational. We help decision makers understand the importance of infrastructure to the variety and quality of services that users require. We debunk unfounded fears about radio and antennas. We make clear that industry will work cooperatively with government in a reasonable approach to infrastructure siting that will meet the all the interests involved.

We have had many advocacy successes, but there are always new problems to address. PCIA works closely with our members to identify priority cases and to apply resources to respond effectively to the most important situations. We look forward to another active year of industry advocacy work. **agl**

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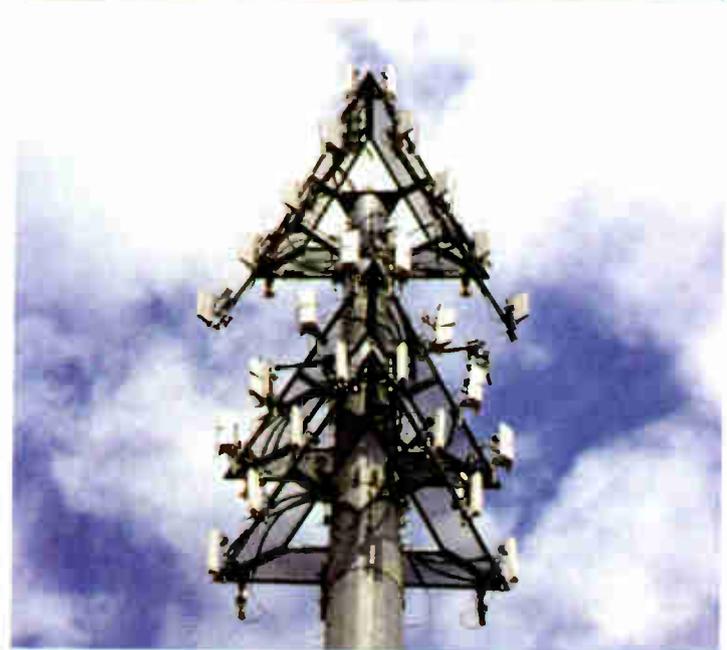
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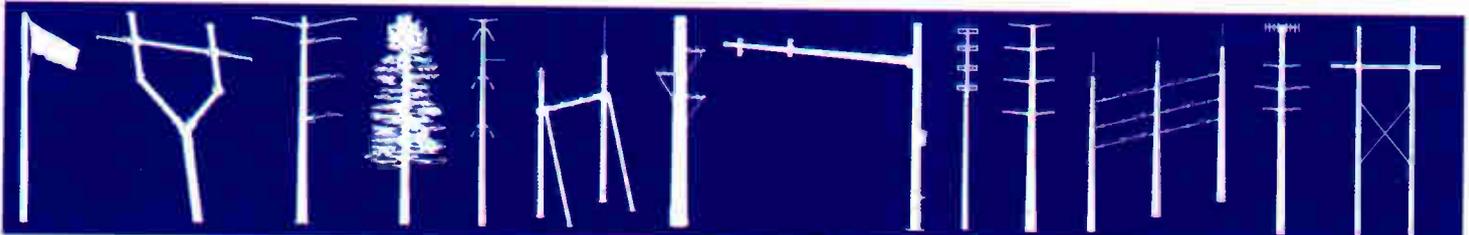
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'Soooo, You Do... What, Exactly?'

by R. Clayton Funk

While selecting a topic for this issue's column, I was discussing with the editors of AGI what you might want to hear about or learn about related to the business side of the tower industry.



While there are many more directions in which our fictitious tower-developer extraordinaire, "Johnny Multiple," will eventually go with his debt-financing process and sales-leaseback explorations, for this issue it was suggested that one topic that hasn't really been

addressed in this space is:

"What do *you* do?"

In other words, what *is* an "investment banker," and what do investment bankers actually *do* as part of their jobs.

Oddly enough, it is a pertinent question because investment banking isn't a profession with which many people are familiar. When little boys and girls are playacting, they rarely dress up in business attire and play "investment banker." The more popular careers that kids envision themselves having someday always seem to be professions with some level of excitement, such as police officer, astronaut, doctor, firefighter—or perhaps even tower climber.

Nevertheless, given the direction many careers are taking these days in a service-

based economy, an investment banker can fill a role in the life cycle of any business.

We've already seen a handful of investment bankers rear their heads in my past columns. In the past, Johnny Multiple and his investors were interviewing investment bankers to solicit opinions on what direction 20× TCF Tower Company should head, given the current market environment. Johnny and his investors brought them in one by one:

- There was "Best Business Brokers," a generalist firm that claimed to be "experts" in all businesses ranging from title companies to floral shops to dry cleaners to funeral homes. Johnny quickly dismissed them after they referred to a monopole as a "monotower" and to a guyed tower



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as a "lined tower."

- There was "IPO I-Bankers," a large firm with over 1,000 employees. Johnny felt he and 20× TCF Tower Company would be just another client. Johnny didn't want to be a 2,000-site tower company, and he thanked them for bringing in their 10-person "deal team" for the presentation.
- There was "Fast-talking Freddy" with "Flat-fee Financial," who claimed to have two hot, active buyers ready to buy Johnny's company immediately. He insisted that Johnny shouldn't pass up this opportunity to sell—now. Johnny was uncomfortable with the high-pressure sales tactics of Fast-talking Freddy.
- Finally, there was an experienced tower investment banker—"Ned Negotiator" from "Ethical Experienced Intermediaries"—who came to meet with Johnny. It was a firm that specialized in the wireless tower industry and also had a track record of raising capital and

selling assets. Ned made Johnny comfortable with going forward.

So, using the example of Ned Negotiator from Ethical Experienced Intermediaries, let's address the question of what an investment banker like Ned might do for any business owner, especially a tower company.

What does an investment banker do?

In the simplest context, an investment banker helps advise companies on the best course of action for their business; one that, more times than not, culminates in a sale of the business.

While an investment banker could offer guidance and advice on how to manage a company on a day-to-day basis, the most valuable perspective an investment banker can provide is the "big picture" on market conditions, current trends, where the market is going and what a business owner should do today to maximize the value of the

company in the future. Where are the TCF multiples today and where are they heading? Why will they head up or down? What will be the effect of future wireless technologies on the tower business? Ned Negotiator won Johnny's business because he took the time to really understand what Johnny wanted and then advised him on the best course of action for 20× TCF Tower Company to reach its goals. In short, an investment banker can, generally, assist with:

- raising capital—either initial seed capital or growth capital—equity and/or debt.
- restructuring the capital structure of a company.
- recommending and executing strategies for taking over and merging with other companies—"buy-side" mergers and acquisitions.
- advising and negotiating on behalf of a company that is interested in selling all or some of the business—"sell-side" mergers and acquisitions.

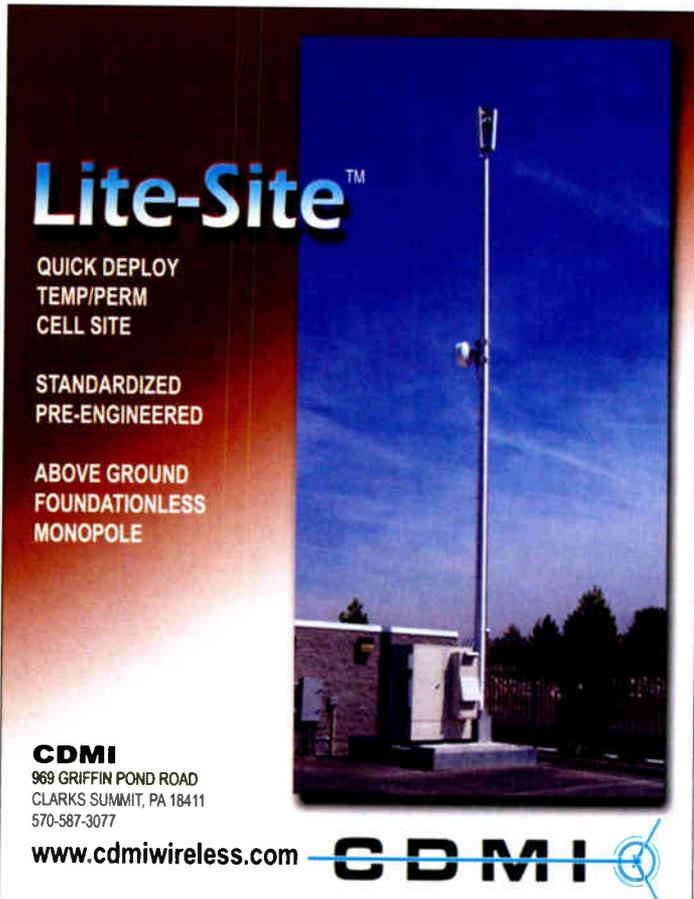


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carrier wants it. But at what cost?

You might do all the work yourself and not pay anyone, but you might spend more time than anticipated, invest more money than you had planned or ultimately lose the opportunity because you didn't move quickly enough.

As carriers themselves have discovered over time, it is worth every dollar to have an experienced and knowledgeable firm doing site acquisition, as opposed to trying to handle it all yourself.

The same goes for the services an investment banker provides. Can *anyone* invest the time and resources to raise money or sell a company themselves? Sure. However, how does the seller know every option has been exhausted? Or that the terms and conditions are the most seller-friendly? Can you rest assured that the investment agreement with the financial partner won't later come back to haunt you if things don't go as planned?

Most importantly, how does the

seller know it got the best market price available? If there is *anything* constant about any financial market, it's that it will *change*.

Different buyers at different times are either less or more aggressive when making acquisitions. An experienced and knowledgeable banker will make sure a seller gets the best possible deal at the time the owner decides to divest.

What makes a good investment banker?

It takes knowledge of the marketplace, honesty, integrity and—most of all—the right “fit” for the client. Think again about Ned Negotiator. Did he and Johnny hit it off and work together? Yes, but Ned and his firm don't work with every company, nor do they facilitate every transaction.

Everyone has different tastes. Some companies like working with generalists, like Best Business Brokers, because they hope to be more in control with someone who doesn't really know

the business. Some companies will always go for the “brand name” of a firm like IPO I-Bankers. Some entrepreneurs like working with a Fast-talking Freddy because he tells them what they want to hear. Ultimately, the decision to hire someone should benefit the client by allowing the client to focus on day-to-day responsibilities while having the investment banker address the “big picture.”

Investment bankers are experts in their chosen field, as are you. Be it site acquisition or maintenance, tower erection or inspections, selling tower space or the actual steel that occupies the space that carriers lease, everyone in the “value chain” of delivering a terrestrial-based signal adds value along the way.

Have a great time at the Wireless Infrastructure Show in Orlando. **agl**

Funk is managing director of Media Venture Partners, San Francisco. His email address is: cfunk@mediaventurepartners.com.

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Stress at Work

Focus on what you *can* control.

by David Saul, AAI

Over 75 percent of Americans consider their jobs to be stressful. Although what causes stress in one person may not be a problem for another, the things we can't control seem to universally cause us the greatest stress.



Other common job stressors include a heavy work load, intense pressure to perform at peak levels, job insecurity,

long work hours, excessive travel, office politics and conflicts with coworker. While dealing with stress is a normal part of everyday life, the following *early warning signs* serve as red flags, alerting you to stress on the job:

- insomnia.
- anxiety or depression.
- low morale.
- short temper.
- headache.
- stomach or back problems.

Managing job stress

The good news is that it is possible

to manage job stress by becoming aware of what increases or decreases your level of stress. The following are six methods to help you manage your stress at work:

1. *Plan and prioritize:* Don't panic, set realistic deadlines, don't rush into the first idea you have and always have an alternative plan.
2. *Focus on what you can control:* Create a "to do" list to prioritize your work. Break larger tasks into smaller, more doable steps.
3. *Slow down:* Think things through before you act, and begin with an end result in mind. If you don't get something right the first time, you'll waste more time having to do it again.
4. *Think outside the box:* Don't do things under pressure. Search for alternatives that will both save you time and money, and put your projects into fresh perspective.
5. *Use all your resources:* If things don't go exactly as planned, don't rely on your internal resources. If possible, outsource tasks to someone reliable.
6. *Take a break:* To release stress, take time to take a break. Taking a walk or discussing your work situation

with another person may help you to gain a fresh perspective.

Considerations for employers

Employers, managers, supervisors, and business owners have many reasons to be aware of and to respond to the stress level of their workers:

Financial

- Stressed employees take more sick days and file more disability or workers' compensation claims than contented employees.
- When disgruntled employees quit after extensive investment has been made in their training, the cost is duplicated to hire and train new persons to replace them.
- Job stress can and does result in decreased productivity.
- Errors made by stressed workers can result in faulty products or services that cannot be sold, or worse, that fail after the sale, which can lead to lost business and lawsuits.

Emotional

- Stressed workers may become depressed or angry, suicidal or violent.
- Alcohol or drug use increases as a



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self-medication for distress, which in turn creates more problems.

Safety

- People who are overly stressed are less attentive and can accidentally damage equipment or injure themselves or others.
- At the extreme, stress can lead to violence, and management or co-workers can be hurt or killed.

Early warning signs

- Headache
- Sleep disturbances
- Difficulty in concentrating
- Short temper
- Upset stomach
- Job dissatisfaction
- Low morale

Primary stressors for employees

- Individual's response
- Working conditions

Job conditions that can lead to stress for employees include:

- task design.
- management style.
- interpersonal relationships.
- work roles.
- career concerns.
- environmental conditions.

Strategies for stress management and reduction include:

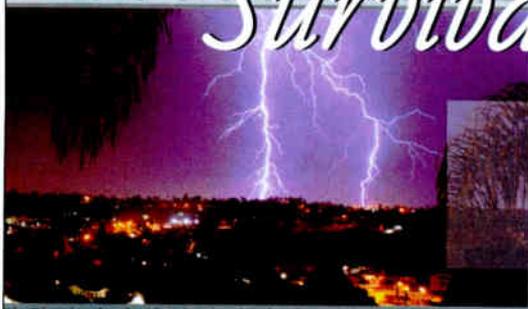
- Establish an employee recognition program for rewarding good work performance.
- Provide opportunities for career development.
- Promote an organizational culture that values the individual worker.
- Ensure management actions are consistent with organizational values.
- Provide stress-management training and an Employee Assistance Plan.
- Look for ways to improve working conditions.

The National Institute for Occupational Safety and Health (NIOSH) highlights knowledge about the causes of stress at work and outlines steps that can be taken to prevent it. Visit them at www.cdc.gov/niosh.

No standardized approaches or simple "how to" manuals exist for developing a stress prevention program. Program design and appropriate solutions will be influenced by several factors: the size and complexity of the organization, available resources and especially the unique types of stress problems faced by the organization. **agl**

David Saul is vice president of Atlantic Risk Management, Columbia, MD, and an accredited advisor in insurance (AAI). His email address is: dsaul@atlanticrisk.com.

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Fuel-spill Plans: The Clock is Ticking

by Julia Custer

What do the *Exxon Valdez* and your telecommunications site have in common? Since 1989, when the tanker *Exxon Valdez* spilled its contents into Alaska's Prince William Sound, spill-prevention regulations have given the federal government more authority to regulate oil storage and oil spills.



Although facilities storing more than 1,320 gallons of petroleum above ground have long been required to

maintain a Spill Prevention, Control, and Countermeasures (SPCC) plan, large spill events in the last 20 years have resulted in a strengthening of the EPA's ability to fine offenders.

The EPA has levied fines against many industries, including the telecommunications industry, for failure to have an SPCC plan. Fines for SPCC-related violations range from \$800 to \$1 million, and are often rolled up with related violations into larger, more expensive, findings. Administrative penalties for SPCC-related violations can reach up to \$10,000 a day.

In the wake of EPA violations against Alltel, AT&T, WorldCom, Sprint and Dobson, other carriers have scrambled to ensure that fuel at their

facilities is covered in an SPCC plan.

About SPCC regulations

Clean Water Act Section 311 (Oil Pollution Prevention regulation, 40 CFR Part 112) requires that regulated facilities have a fully prepared and implemented SPCC Plan. The purpose of this plan is to ensure that facilities put measures in place to prevent oil spills that could reach the nation's waterways.

Any facility with an aboveground storage capacity of more than 1,320 gallons of petroleum, oil or lubricants (or a total completely buried oil storage capacity greater than 42,000 gallons) must prepare an SPCC plan. Only those containers that hold 55 gallons or more count

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Twelve new reasons why you should meet with MVP at PCIA.

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| <p>National Grid Wireless US has agreed to be acquired by M/C Venture Partners and Wachovia Capital Partners for \$290,000,000 MVP represented the investors</p> | <p>Southeast Towers, LLC A portfolio company of Seaport Capital, consisting of 180 Towers has been sold to Diamond Communications LLC MVP represented Southeast Towers</p> | <p>National Grid Wireless Holdings, Inc. has acquired ClearShot Communications 235 Towers MVP represented National Grid</p> | <p>Horvath Towers \$8,000,000 Investment of Equity from Peppertree Capital Fund, LP MVP represented Horvath Towers</p> |
| <p>National Grid Wireless Holdings, Inc. has acquired Beacon Broadcasting Corporation 11 Towers MVP represented National Grid</p> | <p>BFT Tower Co., I&II has sold 10 Towers to Global Tower Partners MVP represented BFT</p> | <p>Tower Site Solution, LLC has sold six towers in South Carolina and one in Georgia to Optasite, Inc. MVP represented Tower site Solution</p> | <p>CitySwitch LLC has sold certain towers in Georgia and Indiana to SBA Towers II LLC MVP represented CitySwitch</p> |
| <p>Big Bend Towers, LLC has conveyed certain assets in Florida and Georgia to SBA Towers II LLC MVP represented Big Bend</p> | <p>Tribune Broadcasting has sold a tower in Indiana to Horvath Communications MVP represented Tribune</p> | <p>Prime Sites, LLC has sold a tower in Wisconsin to SBA Towers II LLC MVP represented Prime Sites</p> | <p>Independence Media Holdings LLC has conveyed certain towers in Illinois to Optasite, Inc. MVP represented Independence Media</p> |

Looking at the deals listed above, it's clear we've been busy since the last PCIA show. As one of the nation's most effective investment banking firms, MVP is known by industry veterans and clients alike as the advisor you can trust to get you the outcome you want.

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toward the storage capacity total. Many telecommunications facilities in remote areas (and those that have extensive backup-power resources) exceed 1,320 gallons of aboveground tank storage.

The definition of "oil" includes petroleum, fuel oil, synthetic and mineral oils, sludge and grease. This compliance is required regardless of whether the aboveground containers in question are within a secondary containment.

The SPCC plan must be reviewed every five years and amended as needed. SPCC plans that require certification by a registered professional engineer (PE) must also be reviewed every five years and amended as needed. A copy of the plan must be maintained at the facility if it is attended at least four hours per day. In addition, the facility must have a spill contingency plan if secondary containment (e.g., earthen berms surrounding the oil storage tank, or a double-walled tank) cannot be provided for the storage tank.

Recent regulatory changes

SPCC requirements include developing and implementing an SPCC plan that adequately describes the facility and how the facility complies with 40 CFR 112. If the facility stores less than 10,000 gallons of petroleum, oil or lubricants, or if it has not had a spill greater than 1,000 gallons or two spills exceeding 42 gallons each in the previous three years, the facility may prepare, self-certify and implement an SPCC

plan without a PE certification.

Although SPCC regulations have been on the books since 1973, significant changes to the rules were finalized in 2002. In July 2002, EPA published amended oil pollution-prevention regulations promulgated under the authority of the Clean Water Act. The updated regulations revised SPCC applicability and amended SPCC plan requirements, among other modifications. The regulations have undergone multiple updates. As a result, the compliance dates have been extended.

As the regulation currently stands, an SPCC-subject facility in operation prior to August 2002 must update and implement its plan *no later than the end of this month (Oct. 31, 2007)*. An SPCC facility that does not have a plan in full compliance with 40 CFR 112 and that was in operation prior to August 2002 is in violation of SPCC plan requirements. New facilities subject to SPCC regulations must prepare and implement a plan before becoming operational. The plan must be reviewed every five years, and the facility owner must certify that the plan review is conducted.

The SPCC regulations provide temporary alternatives for those facilities that are unable to fully comply with the regulations at the time the SPCC plan is written and certified. If the owner of an SPCC facility requests an extension, the EPA Regional Administrator may authorize an extension for the full

implementation of the plan or any amendment of the plan beyond the time permitted. The written request must include an explanation of the cause for the delay, the aspect of the plan affected by the delay, actions being taken to minimize or mitigate the delay, and a proposed time schedule for the implementation of corrective actions.

Basic responsibility

Site managers often do not realize the reporting burden that goes along with providing backup fuel at telecommunications sites. Typical switch stations and large, multi-carrier sites have enough fuel-storage capacity onsite to trigger SPCC regulations. Storage of oil, used oil, gasoline, diesel fuel and heating oil in any container holding 55 gallons or more counts toward the total amount of petroleum at a site.

Failure to prepare an SPCC plan, and follow it in the event of a spill, can lead to large fines and unwanted scrutiny from regulators. Following simple preventive measures and basic spill response procedures protects the nation's waterways, and protects the bottom line. The cost to prepare an SPCC plan is far less than the cost of an EPA fine. **agl**

Custer is an environmental regulatory specialist and telecommunications program lead with Aarcher Inc. She can be reached at jcuster@aarcherinc.com or 410-897-9100, ext. 101.



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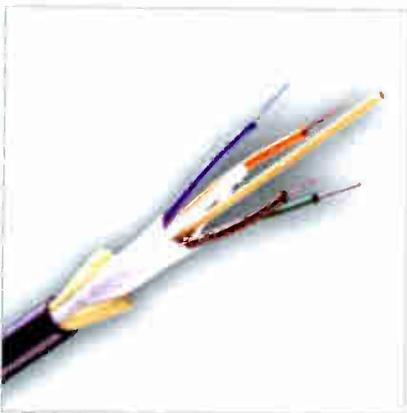
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It makes dollars, and it makes sense, to get cash now. A bird in the hand is worth two in the bush.

by Jarred Saba



Whether you are a tower company looking to expand your business or a farmer with a cellsite on your land, financing your wire-

less lease gives you the ability to pull capital forward in advance of performance. Smart investors know that a significant amount of capital in hand today is more valuable than small monthly or yearly payments.

Tower owners looking to expand their business can use their tenant-lease income as leverage to obtain capital for re-investment. For example, if two tenant leases were earning \$1,000 each a month and escalated 3 percent annually for a 20-year term, your lease revenue would accumulate to about \$645,000 over the course of the term.

With all things constant, you could finance your lease through a non-recourse loan and receive \$200,000 of investment capital today. If you are savvy, then you could then use the proceeds to build a new tower. Even with a conservative 8.5-percent return on investment of the new tower, you would gross more than \$1 million before taxes over that same 20 years—doubling your total returns by using the investment capital in a way that you know would give you a better return.

Site promotion and reversion date

The benefit of using the cash flow from the tenant lease as collateral is that you can keep all the upside associated with the tower because you do not have to sell your existing towers to raise funds. Cell-lease financiers are experts

in the industry and understand the true valuation of lease income.

By structuring the transaction as a non-recourse loan, you can choose a loan term (typically between 20 to 40 years). This means that there is a date by which the cash flow will revert back to you. Whether that date is 20 years out or 40 years out completely depends on the individual tower owner's financial needs. The longer the term, the more upfront capital that is provided.

When the lease reverts back to the you, you will have the option to finance the lease again or to receive the cash flow generated from the leases. As long as there is an active carrier on the site, you will continue to have options and opportunities to advance capital again.

Tower owners with collocations are in a favorable position. Collocations allow you future opportunities to finance your leases. With more and more carriers piggybacking tower locations, tower owners have future opportunities for additional



leases and the ability to continue to advance large sums of capital today.

If you have several leases, then you have multiple options. You may finance one lease and keep the cash flow from the others—or finance all or multiple leases. Financing a portion of your lease portfolio and keeping the cash flow from the other portion is a creative and

strategic way to take advantage of your total portfolio. It gives you cash in hand now to reinvest and grow your business, as well as providing recurring revenue from the tower rents to satisfy normal operating costs.

An added bonus is that after one loan, some cell-lease financiers will promote your site to prospective carriers, in the hope of procuring another lease, helping to ensure future business.

Site protection

Essentially, cell-lease financiers are providing capital in advance of performance on an asset that is not guaranteed to fully perform. Therefore, lease-finance companies are assuming a calculated risk that your wireless tenants will be there in the future. This risk is a byproduct of the fact that the tenant-lease income is the only collateral used for the loan.

Although it is in the interests of both parties—tower owners and financiers—for the tenants to stay active as long as possible, there is no guarantee that they all will. If you lose a tenant, whether due to obsolescence, mergers or consolidations, your interests are protected. The proceeds from the financing of leases is non-recourse capital to the tower owner and without a personal-guarantee requirement. So, if the tenant were to vacate, you would not be obligated to repay the balance.

Thus, financing your leases gives you the opportunity to use the proceeds to invest back into your business—or an avenue that produces greater returns and outperforms the lease income. **agl**

Jarred Saba is vice president of the Tower Lending Group and the Corporate Finance Group for Wireless Capital Partners, Los Angeles. You can email him at jsaba@wirelesscapital.com.

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Illustration by Scott Dolash.

Tower owners should embrace safety considerations with the same sobriety as their tower construction and maintenance contractors. There is no ceiling on the costs represented by the loss of human capital. The surge in tower construction- and maintenance-related accidents and fatalities is avoidable, not inevitable.

AVOIDING TOWER CONSTRUCTION AND MAINTENANCE ACCIDENTS AND FATALITIES



ANATOMY OF A FALL

by D. A. Keckler

There is no truth to the adage, “You can’t put a value on human life.”

Whenever there is a serious injury or fatality related to tower work, someone involved will be quoted as making that statement in some newspaper, magazine or blog article. The more accurate way of saying it should be, “You

can’t put a cap on the value of human life.”

People have been valuing human life for at least 100 years now. In 1908, a French actuary named Barriol created a means of estimating the “social value of an individual.” In true accountancy fashion, he even broke it down comparatively by age group and

country. This work would figure into the later estimates of what the First World War cost the countries involved. For an American (the most valued), it conservatively worked out to about \$4,720 in “social value.” That’s about \$65,000 in today’s money. Early value factors included future labor (work that would have

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been expected to be produced) and the loss of the individual in question as a consumer (how much he was expected

the subject of "human capital economics" has become increasing sophisticated. Insurance companies, business analysts and the legal profession (through litigation analytics) have added more compensation variables to the equation: net future earnings, anticipated changes in earning level, pain and suffering, the return or replacement value of money invested in education and training, and so forth.



construction activities in 2006, fully one-third of them related to falls. So, compared to the overall universe of construction activity, a half-dozen tower-related deaths over several months, or even 15 or 20 over the course of a year, although disturbing and regrettable, might not seem to be an extraordinarily high percentage. But that's not the way OSHA looks at these things. It puts accidents and fatalities in the context of how many people are employed doing that specific work. Compared to the relatively small universe of specialized tower workers within the construction industry, even a handful of injuries or fatalities is a percentage with an exclamation mark.

to have contributed to the economy by buying things). In the ensuing century,

The rash of tower-climb fatalities this past summer simply has to give the industry pause. There were more than 1,200 fatalities generally related to U.S.

The rise in tower accidents is also particularly disturbing because it bucks the overall national trend for occupational fatalities. The Bureau of Labor Statistics' Census of Fatal Occupational

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Injuries for 2006 shows that the fatality rate declined to its lowest level since BLS began collecting data in 1992. The rate last year was 3.9 fatalities per 100,000 employees, down from 4.0 in 2005. The tower industry, by rough estimate, has been averaging a dozen fatalities per 5,000 employees.

One difficulty in precisely defining our industry's statistics is accurately determining the causes and actual number of serious injuries and fatalities. News accounts are generally unreliable, an admixture of hearsay, supposition and opinion by unqualified first responders, casual witnesses or distraught relatives. Qualified investigation mostly falls in the realm of OSHA, and its records are tricky to assemble in one pile. Among regions and offices of the agency, there is a lack of uniformity in how tower accident investigation reports are reported and catalogued. The incident may be variously logged into the database as "fall," "climbing accident," "tower fall," "construction accident" or with the use of some other descriptor.

Prevention and protection

In a perfect world, fall prevention means eliminating fall hazards from the workplace. In the antenna-siting industry, this is problematic because the hazard itself is the site of the work. Because most of the hazards cannot be eliminated, pre-climb safety procedures attempt to minimize the risk before work begins. Fall-protection systems, therefore, must be used to ensure the safety of the workers.

Although you may be a tower owner, and this might seem more like a contractor issue, there is always the possibility of consequences if a serious accident or fatality occurs at one of your sites. Even tower owners should familiarize themselves with OSHA's standards. The most pertinent are OSHA 1910.146, "Permit Required Confined Space for General Industry"; OSHA 1926.500, "Subpart M Fall Protection for Construction"; and OSHA 1910.66, "Appendix C Personal Fall Arrest Systems."

You need to assess your liability if fall-arrest equipment is a permanent

fixture on your towers. Likewise, inspection and maintenance of anchorage points and climbing hardware attached to a tower are usually an owner's responsibility. OSHA defines "anchorage" as "a secure point of attachment for lifelines,

lanyards, or deceleration devices." and OSHA Subpart M, 1926.502(15) requires that "Anchorages used for attachment of fall arrest equipment shall be independent of any an-

The rise in tower accidents is also particularly disturbing because it bucks the overall national trend for occupational fatalities.

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chorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as follows: (i) as part of a complete personal fall arrest system which maintains a safety factor of at least two; and (ii) under the supervision of a qualified person.”

You need to verify insurance and indemnity clauses. You need to confirm that all contractors adhere to federal OSHA standards as well as state OSHA guideline compliance. Make these assurances part your contracts for site work.

Developing a “safety attitude” within a company is an important part of this business, and attitude is as important as altitude. Fall-protection programs and procedures are only as good as the enforcement the contractor or site owner imposes. Decreasing the number of accidents and fatalities in this industry will depend in large part on who you hire to the work. Choosing con-

tractors who belong to the National Association of Tower Erectors and those who can demonstrate employee certifications or safety training instead of the cheapest bidder will wean out those crews that use too young or too inexperienced workers as if tower work was a general construction project, like carrying bricks.

There have been a number of technological advances in recent years in materials used and manufacturing methods to produce a better quality of harnesses, wire ropes, suspension-trauma relief and similar devices.

However, despite the quality of equipment, accidents continue, and many are attributed to a failure to use, or properly use, this equipment in the first place.

Our friend and past AGL contribu-

antenna. The tower is the main broadcast tower for several TV and radio stations in their area. As the crew began to deploy the hoist and rigging, crew member Josh Klinghagen discovered a spot with several broken wires in the

5/16-inch wire rope tag line. The damage was 600 feet into the line, enough wear to exceed removal from service criteria. Later they discovered similar damage in the 9/16-inch load line. That damage was 1,550 feet into the line and also exceeded the specs.

Kyle called his safety director to report his findings and the job site was shut down. Further investigation revealed that the ropes had become brittle in those spots, and putting a bend on the damage caused wires to continue breaking. Use of that hoist on this particular job could have easily led to a catastrophic failure.

This wasn't a case of bad equipment maintenance or 10-year-old rigging. Both of the wire ropes were less than a year old, and their work history was documented. You might assume that a relatively new wire rope wouldn't have any problems, and many crews might neglect to perform a proper pre-job inspection.

That assumption could have been a serious mistake. In this particular case, further analysis showed the damage was akin to what would be expected from exposure to high heat, but there were no signs of RF arcing, and only subtle indications of heating. No welding or cutting work had been done on the jobs where that hoist had been used.

The cause of the damage remains under investigation, and I have no doubt Sioux Falls won't let it rest until the cause is found. Being proactive requires good training and constant attention to safety, and that's an attitude an organization must have from the top down. **agl**



tor Matthew Arps, general manager of AnchorGuard, Sioux Falls, SD, recently sent us the suggestion that we introduce a featurette somewhere in the magazine called the “AGL Safety Save of the Month.” The idea would be to publicly recognize tower hands “that have made full use of their skills and training to make our work environment and industry safer.”

As an example, Matt cites Kyle Wengler and his crew at Sioux Falls Tower & Communications. Kyle and his crew began rigging a 2000-foot tower to install a new FM broadcast

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Charles S. Hayes Inc.

MANUFACTURER
Valmont

TOWER TYPE
Self-Support

HEIGHT
280 Feet

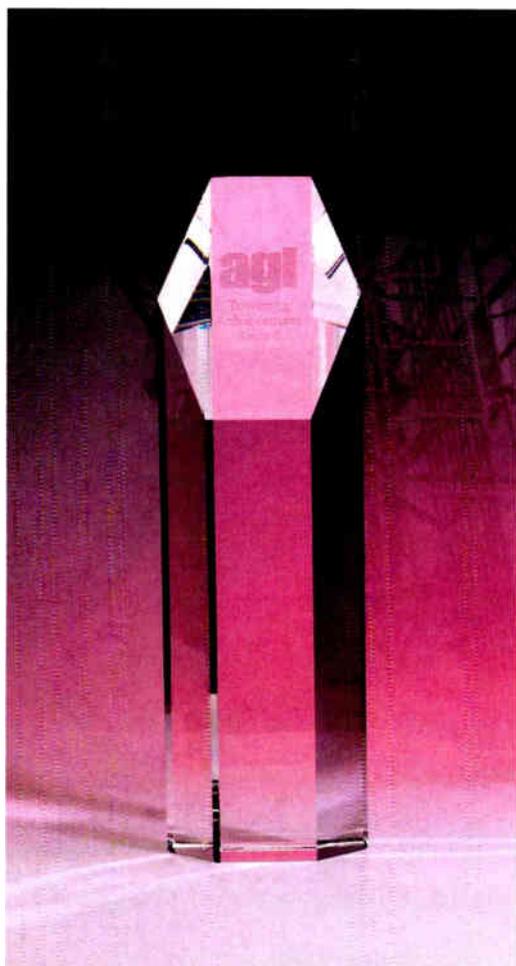
APPLICATION
Cellular, Internet, PCS

LOCATION
South Bend, Indiana



Excellence by an Individual

Alabama Wireless Association president and Birmingham, AL-based telecommunications attorney N. Andrew Rotenstreich receives AGL magazine's 2007 award for personal service to the industry.



AGL's Towering Achievement Awards program, initiated in 2006, recognizes individuals and companies within the antenna-siting community in particular, and the wireless infrastructure realm in general, that have performed extraordinary service to our industry. The Individual Achievement Award recognizes individuals not for their corporate success, but for that after-hours effort to improve, expand and serve the industry, its tenants—and best tenets. It demonstrates an appreciation by one's peers for personal excellence "above and beyond the call of duty."

AGL is pleased to announce that this

year's Individual Achievement Award, to be presented at PCIA's Wireless Infrastructure Show in Orlando, is N. Andrew "Andy" Rotenstreich.

Rotenstreich was a co-founder of the Alabama Wireless Association (AWA), one of the earliest-to-form state wireless association programs (see page 57 for more SWAP news) and currently serves as that association's president. Alabama was the second state to form a state wireless association and the first meeting was held in September, 2003. This business league for the Alabama wireless telecommunications industry has grown to nearly 300 members, including members representing carriers, tower companies and vendors serving all aspects of the industry. As with other state associations, AWA provides an opportunity for its members to cultivate relationships within the wireless industry, create a unified voice that supports the development of quality wireless networks, enhance the communities they serve and contribute to a spirit of charitable giving. Over the past three years, Rotenstreich has been instrumental in the success of the AWA charity golf tournament, which has raised over \$21,000 for The Bell Center for Early Intervention Programs.

Rotenstreich is an attorney with Haskell Slaughter Young & Rediker LLC in Birmingham, AL, for which he represents all major wireless carriers, as well as tower companies and other industry clients. His experience in the telecommunications industry includes regulatory matters and site acquisition and development. He also has extensive experience in land-use

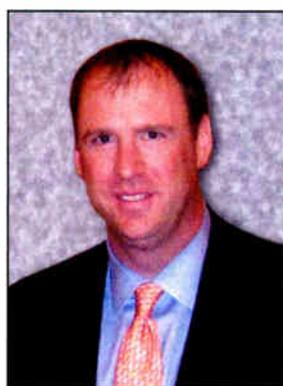
and zoning matters, and has appeared before municipal entities and in state and federal courts on zoning matters.

Rotenstreich is actively leading legislative efforts to address zoning issues in Alabama that have affected the growth of the wireless industry. In 2005 and 2006, Rotenstreich was named in the Birmingham Business Journal's "Best of the Bar" poll for his expertise in telecommunications law.

In addition to his efforts on behalf of AWA, Rotenstreich has been a key organizer of the annual Tri-State Wireless Association Meeting jointly held by the Alabama, Tennessee and Georgia SWAP associations. He was also instrumental in the first gathering of FCC, Native American Tribal Representatives and industry personnel at a conference in Birmingham that addressed implementation and effect of Section 106 Programmatic Agreement. Rotenstreich is a member of the newly formed SWAP National Executive Committee and is serving a two year term as one of three presidents on this board.

Rotenstreich truly is an asset to the wireless industry. His knowledge of the legal issues helps battle and clears the paths for continued success of network deployment throughout the southeast.

He is a valued supporter of SWAP and each state wireless association and has always offered assistance in speaking with people throughout the country to help establish other associations. His passion for wireless, his job and his community highly qualifies him for recognition of AGL's Towering Achievement Award.



Andy Rotenstreich will be honored by AGL at PCIA's Orlando show.

agl

Excellence by a Company

Virginia-based Invisible Towers LLC receives AGL's 2007 company award for its concealment solutions and product contributions to assist tower owners in meeting difficult siting challenges.

AGL's 2007 Towering Achievement Award "for excellence by a company providing services to the antenna-siting community" will be presented to Invisible Towers LLC of Waterford, VA (principals Tim Dennis, Van Thompson and Mark Faris) at PCIA's Wireless Infrastructure Show in Orlando, FL.

Nominations praised Invisible Towers for two sites in the Sterling, VA, area. Cascades, a planned community of 6,000 homes, had sparse wireless coverage, and wireless carriers endured subscriber dissatisfaction for years. Multiple proposals to build a 190-foot lattice tower or monopole at a fire station failed to overcome opposition. Invisible Towers developed a proposal with two, shorter, disguised towers, that won overwhelming support from the community, municipal regulators and elected officials. The "Lowes Island" site is a 110-foot clock tower built as the focal point of a shopping center expansion. The "Cascades Safety Center" is a 100-foot "hose tower" designed to match the adjoining firehouse.

John L. Chellman, senior account executive, USA Telecommunications, Springfield, VA (affiliated with Cingular Wireless/AT&T), noted that besides the designs, Invisible Towers undertook an extensive community outreach program. The company hosted public meetings, advertised in homeowners' association newsletters and contributed several informative articles to those newsletters, all to demonstrate that "Not all cell towers are the same."

Invisible Towers also used an innovative online petition to enable project supporters to register and send an email

of support to elected officials.

Barbara Pivec, owner of Atlantic Site Acquisition, Queenstown, MD, said another Invisible Towers project was "One winning tower that constitutes the complete perfection of hard work, perseverance, communication and just plain doing it the right way."

In 1992, Cellular One/SBC issued a search ring for Oakton, VA. The area includes the Difficult Run Watershed in

Eventually, major site-acquisition firms refused to accept search rings for the location because of the apparent futility.

Over a period of years, Invisible Towers built a relationship with a church to develop a siting plan for a 100-foot "monopine" tower acceptable to the church and the host community. The plan focused on the appearance of the branches, pole, fence, grading and landscaping, and assured that hardware and equipment would be hidden.

Community outreach and work with the county regulatory staff led to unanimous approval by the county board of supervisors. Its chairperson noted that Invisible Towers set a new kind of siting record for the county: It was the first time they had approved a tower without opposition.

When completed, the tree pole went into service with all five major carriers serving that area under contract.

As referenced in AGL's 2007 site concealment issue ("Too Be or Not to Be—Seen, That Is," AGL July 2007), Invisible Towers has also been in the vanguard of developing new materials for tower camouflage. The company is deploying tower wraps that camouflage new or existing towers through the use of disruptive, or fractal, coloring. The pixilated fractal patterns are printed on film with a proprietary pattern and can be used to blend the tower into the site's background. The tower wrap

is available in several colors, and can be purposed for either blending in with the sky, for isolated towers, or forest blends to visually meld a tower with surrounding trees and undergrowth.

agl

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Invisible Towers' projects employ a number of camouflage solutions designed to engage community support for antenna sites.

Fairfax County and a residential community with homes worth up to \$3 million. The area also includes parks and historical assets. Carriers tried unsuccessfully for 15 years to develop a site in the area.

Effect of the New 'Rev G' Structural Standard on the Wireless Industry

Here are some stepping stones you can use to avoid puddles of confusion as adoption of the standard progresses across state and local jurisdictions.

by **Edward A. Gazzola, M.Eng., P.Eng.**

The new "Revision G" structural standard is becoming law in many states and local jurisdictions across the country, and with it comes a ripple effect that will affect those involved in the wireless industry (carriers, tower owners, structural-engineering firms, site-development firms, and companies buying or selling towers, to name a few). Towers that once passed a structural review may now fail, and towers that once failed a structural review may now pass. The following information should demystify this change that is about to sweep through our industry with a particular focus on what to expect and recommendations for preparing for it.

Adoption of the "Rev G" standard

The new "Revision G" structural standard, T1A-222-G: Structural Standards for Antenna Supporting Structures and Antennas, became effective on Jan. 1, 2006. It was created under the auspices of the Telecommunications Industry Association in cooperation with the American National Standards Institute. It is the seventh revision to the standard since its first release in 1949. It is also the first revision in 10 years and contains the most significant industry-affecting changes since the fourth revision in 1987.

Like any industry-produced technical standard, it is not enforceable until it has been adopted as part of state or local

building codes. In the first year following its release, only one state officially adopted the new standard—Florida, in December 2006. Although several states and local jurisdictions were anticipated to adopt Revision G this past summer, others may take several years to adopt the standard into law. It is also possible that some jurisdictions may never adopt the new standard. For companies working in multiple states, the next several years may be confusing for all involved.

New vs. old standard

So what are the big differences between the preceding standard, "Revision F," and the new standard, "Revision G"? The following summarizes, in non-technical language, six major changes:

1. Change in design philosophy

— The approach for structural analysis of a tower has now been made consistent with the approach used for analyzing other structures, such as buildings and



bridges. Because of this change in philosophy, all the formulas engineers use for analysis have now changed, and may produce different results than in the past.

2. Modified wind loads — The approach used for determining the wind load on a tower has changed, again to be consistent with other structures. Rather than using the average speed of one-mile of wind, the highest gust over a three-second period is now used, thus potentially changing the wind load applied to a tower.

3. Mandatory ice loads — Currently, tower owners decide whether or not ice loads should be considered and to what extent. Historically, zero to one-half inch of radial ice was used. Under Revision G, ice loads are now mandatory and can vary from zero inches to one-and-a-half inches, thus potentially adding more load to the tower.

4. New site-condition factors — A

new “exposure and topographic” factor has been added to the standard to address local site conditions. Towers located in open and exposed terrain, or on hilltops, are more exposed to local winds, and factors are now applied to increase the wind load to accommodate these conditions.

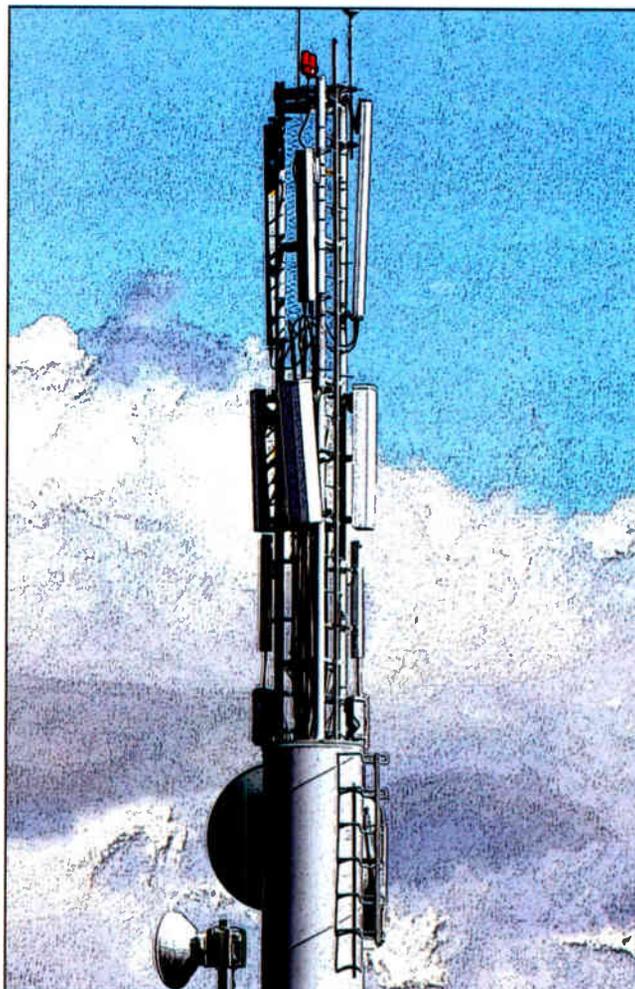
5. New risk-of-failure factors — A new “structure classification” factor has been added to address any increased risk to life or property in the specific location of the tower or to identify a tower that cannot afford to endure a loss of service; i.e., essential communications. There are now three classes of importance factors that can affect tower loading. Some counties have already made this increased factor mandatory, thus increasing stresses.

6. New seismic (earthquake) loading considerations — Seismic analysis, as it applies to towers, is now a mandatory requirement. This condi-

tion rarely governs for most towers; however, this new requirement may affect some towers in seismic areas.

The new standard has numerous other changes and additions, such as site-specific soil conditions, foundations, tower safety and antenna mounts. However, the foregoing are the major ones. In general, the analysis of towers is now more specific to site and tower types. So, what kind of result should we expect?

Although the new standard is not expected to generate significantly different results over the entire population of towers in the country, differences will appear in site-specific applications of the new standard. For example, due to local site conditions, Florida is seeing increased tower stresses. Thus, there is no means of forecasting results on a specific tower until a full structural analysis is conducted.



Confusion expected

As with any significant industry change, a certain amount of confusion is expected. Those involved can expect the following:

- There may be misunderstandings when dealing with municipal building

It is incumbent on all participants in the wireless industry to educate themselves on these changes and prepare their organizations accordingly.

departments.

- Some towers with reserve capacity under Revision F could now fail, and some recently reinforced towers could now pass.
- Potentially, more information, time and cost may be required to conduct a structural analysis.
- There may be increased upgrade costs for certain towers or in certain geographic areas.

Much of the confusion will be because of uncertainty around the timing of when and how the new standard will be adopted in each jurisdiction and site-specific results.

How do we prepare ourselves?

The following are some recommen-

dations to assist those involved in the industry to prepare for this change:

Carriers

- Educate your project and construction managers on the changes and their effects.
- Consider preparing for increased build time due to delays in data-gathering, analysis, permitting and upgrades.

- Be aware that tower owners may need to unexpectedly upgrade certain towers.

Tower owners

- Educate your sales teams on these changes to allow them to better explain the sometimes non-intuitive results to their customers.
- Establish internal policies on your approach to conducting structural analysis due to the timing around adoption of Revision G.
- Inventory your existing site documentation and identify potential problem sites in advance, as some of the effects and delays are predictable.

Structural engineering firms

- The standard is new and software upgrades are new, so check your

results manually.

- Modify internal tools and systems to minimize delays for your clients.
- Plan extra time to explain unexpected results to your clients.

Site acquisition and development firms

- Don't skip over towers that you "know" failed last time; they may pass this time.
- Do your research on local building departments—which standard has been adopted and if there are any modifications.
- Consider factoring-in potential delays to the build plan.

Companies buying or selling towers

- The value of the asset has changed because every specific tower's reserve capacity in the portfolio has changed.
- Involve a tower engineer in the transaction to provide guidance.
- Consider the portfolio as a number of individual assets and not as a whole (law of averages).

Preparation is key

The Revision G structural standard will soon become law in many states and local jurisdictions across the country, while other jurisdictions will be slower to adopt it—or might never do so. Towers that passed under the old standard may fail under the new standard, and vice versa. It is incumbent on all participants in the wireless industry to educate themselves on these changes and prepare their organizations accordingly. The adoption of this state-of-the-art standard, one that is consistent with other industry standards, is the right thing to do, but it may cause considerable pain along the way. As Julius Caesar said, "It is easier to find men who will volunteer to die, than to find those who are willing to endure pain with patience." agl

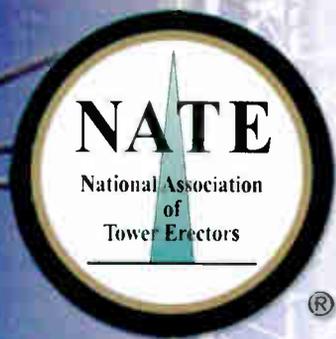
Gazzola is president of Atlanta-based Morrison Hershfield. The engineering firm has been an active member of the TIA/EIA-222 Tower Standard for the past 20 years, as well as other international tower standards.

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Multi-tenant Collocation Platforms for Rapid Wireless Deployments

Tower owners should consider the creation of agreements with an intermediary that is capable of managing multiple smaller customers.

by Adam Rogers

Several years ago, Level3 discovered the difficulties of trying to be a “carrier’s carrier” as well as a hosting and collocation provider at the same time. Providing collocation to a major carrier as part of a long haul backbone solution is one thing.

Providing collocation to a plethora of other, smaller carriers and hosting providers is much more challenging. These customers require smaller footprints, smaller amounts of power, more remote hands technical services, and cross connections.

In an effort to segment its business, Level3 began leasing portions of its

the needs of the small- to intermediate-sized customer. This gave rise to successful sub-tenants such as Qube Networks, Bay Mountain and Peak 10. Taking large areas of Level3 data-center space, these sub-tenants provide full-service collocation and hosting to many smaller customers.

Tower collocation providers should assume a similar model. Major carriers are well suited to perform the difficult, time-consuming and costly task of establishing a presence on many collocation towers. Second- and third-tier providers—especially new AWS and smaller WiMAX entrants with resource and time-to-market constraints—will be looking for alternatives. Without the benefit of shared infrastructure, green-field deployments become a significant barrier to entry for tier 2 and tier 3 entrants. Tower owners should consider the creation of agreements with an intermediary

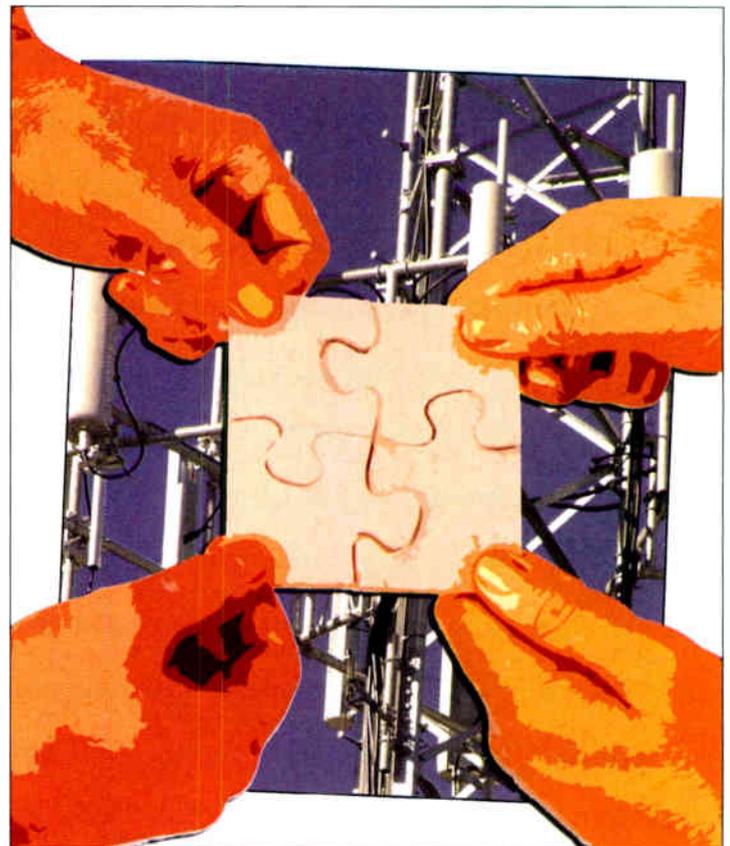
that is capable of managing multiple smaller customers. This will increase participation in the AWS revolution, enhance interest in a particular tower owner’s infrastructure and increase the

Advantages of deploying multi-tenant mounting platforms:

- **terrestrial-based Ethernet access back to a common POP**
- **SLAs on Ethernet service (low latency, low jitter, Sonet protection)**
- **rapid deployment including zoning, power and broadband access**
- **wireless rings for redundancy**

data centers to collocation providers that could do a better job catering to

October 2007



value of tower sites.

Creating a sub-collocation area on a tower would require a single mounting platform installation, an associated power pull, and a broadband wireless

infrastructure plan. The owner of the tower would also be required to have the platform "permitted" with the local municipality. Once these items are completed, sites can be marketed to site-acquisition agents that are capable of selling the sites as "turnkey." A customer could then deploy its wireless equipment quickly and activate service without many of the costs associated

with an individual site installation.

Creating a sub-collocation platform on a tower increases the value of the tower owner by increasing the ratio of dollars per broadband equivalent (BBE) tenant, a common metric used to value towers. The tower owner accepts a lower base rent for the platform but increases its rent for that tower height as tenants lease space.

At full capacity, a tower is capable of generating for the tower owner 1.5x what a typical rent for a given height might normally bring. In addition, the platform owner and operator can take a long-term lease for the height, while managing the risk of shorter term leases across the mix of tenants on the site.

This strategy enhances the value of the tower and increases the attractiveness of a site to prospective tenants that might not normally consider tower space as a viable option for deploying wireless equipment. Potential tenants for this type of collocation might include:

- new AWS operators first entering a market.
- microwave backhaul operators.
- Wi-Fi and WiMAX operators.
- municipalities creating Wi-Fi networks.
- wireless point-to-point service operators.
- integrators deploying wireless networks for government agencies and corporations.
- broadcasters.

A provider of this platform would require careful engineering to ensure that tenants do not interfere with each other's RF space. Nevertheless, by placing 20 to 30 platforms on towers around a market, an operator would quickly attain broad market coverage.

Partnering leads to progress

AWS providers are challenged to find wireless deployment solutions that are quick and reliable. Finding the right collection of towers on which to locate requires careful panning and analysis, but partnering with a multi-tenant collocation provider can greatly increase the speed to market and reduce the risk involved in implementing a broad market-coverage area. These complementary infrastructure services are emerging in a newly expanding wireless market.

agl

Rogers is vice president of Core180, Hoboken, NJ.



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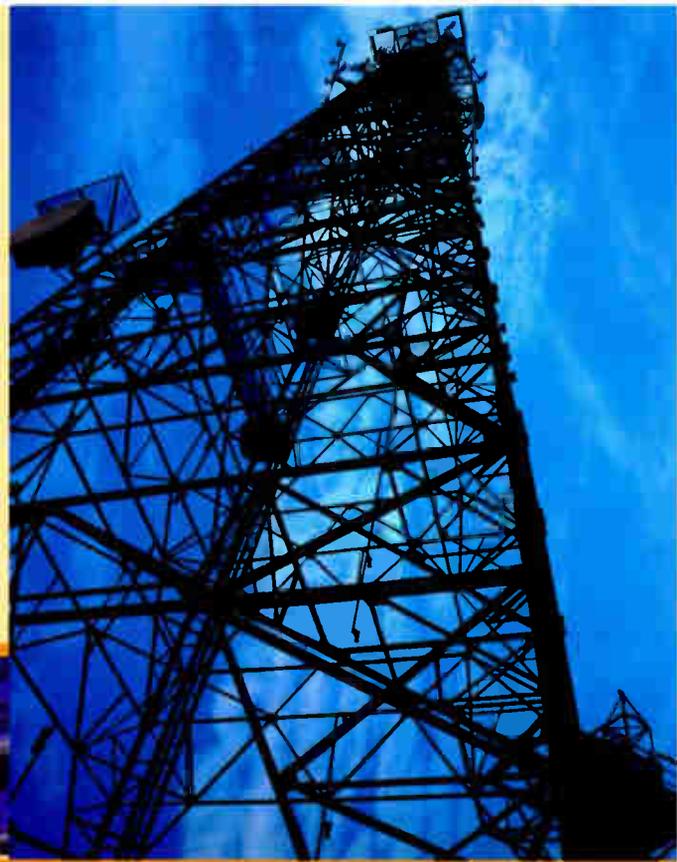


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Enabling the Wireless Future.

Total Cost of Ownership for WiMAX Backhaul Networks

by Greg Friessen

There has been a rapid deployment of fixed and mobile WiMAX access networks globally. This rapid and wide-scale set of deployments has introduced a new set of requirements on the backhaul network, causing carriers to re-evaluate their backhaul architecture. The increased bandwidth requirements of these access networks have placed an increasing focus on reducing the cost per bit of backhaul to

ensure a viable WiMAX business case.

To meet the bandwidth and service requirements of WiMAX backhaul, there have been two primary technology options: licensed wireless and fiber. Fiber is the preferred choice when it can be built on time and economically. However, these two factors, speed and cost, can limit its applicability.

The following information focuses

on the costs associated with wireless backhaul and the efforts to reduce the wireless backhaul cost per bit. Past efforts have primarily focused on reducing capital expenditures (CAPEX) by offering higher capacities for lower costs. While this is important, it is not enough. There have been trends toward increasing labor, spectrum and leasing costs. These trends have combined to

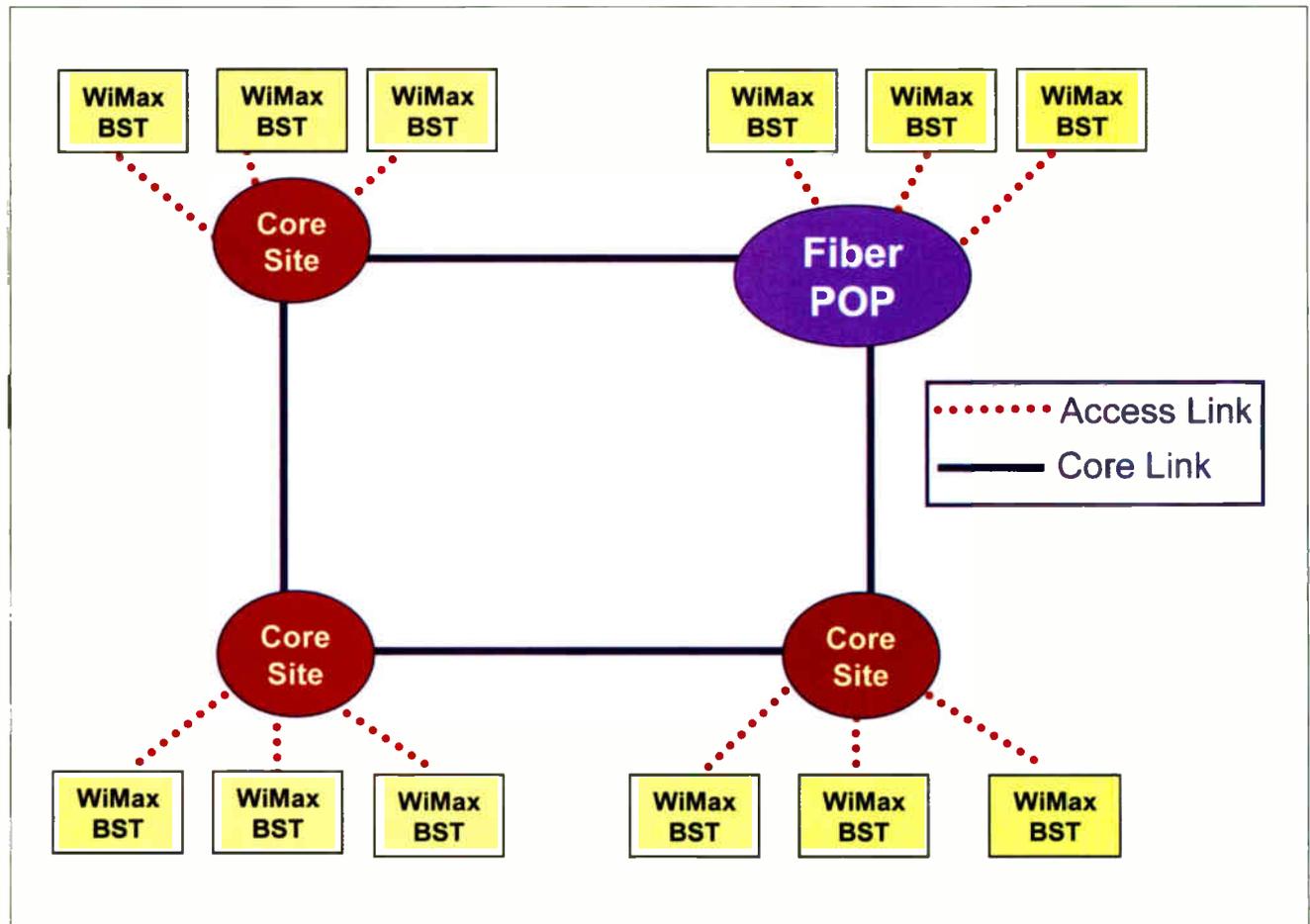


Fig. 1. Based on the network model above and certain assumptions, ownership cost can be determined.

make CAPEX a diminishing portion of the total cost of ownership. As a result, the only way to provide a significant cost reduction in backhaul is to address the increasing operational expenditure (OPEX) costs.

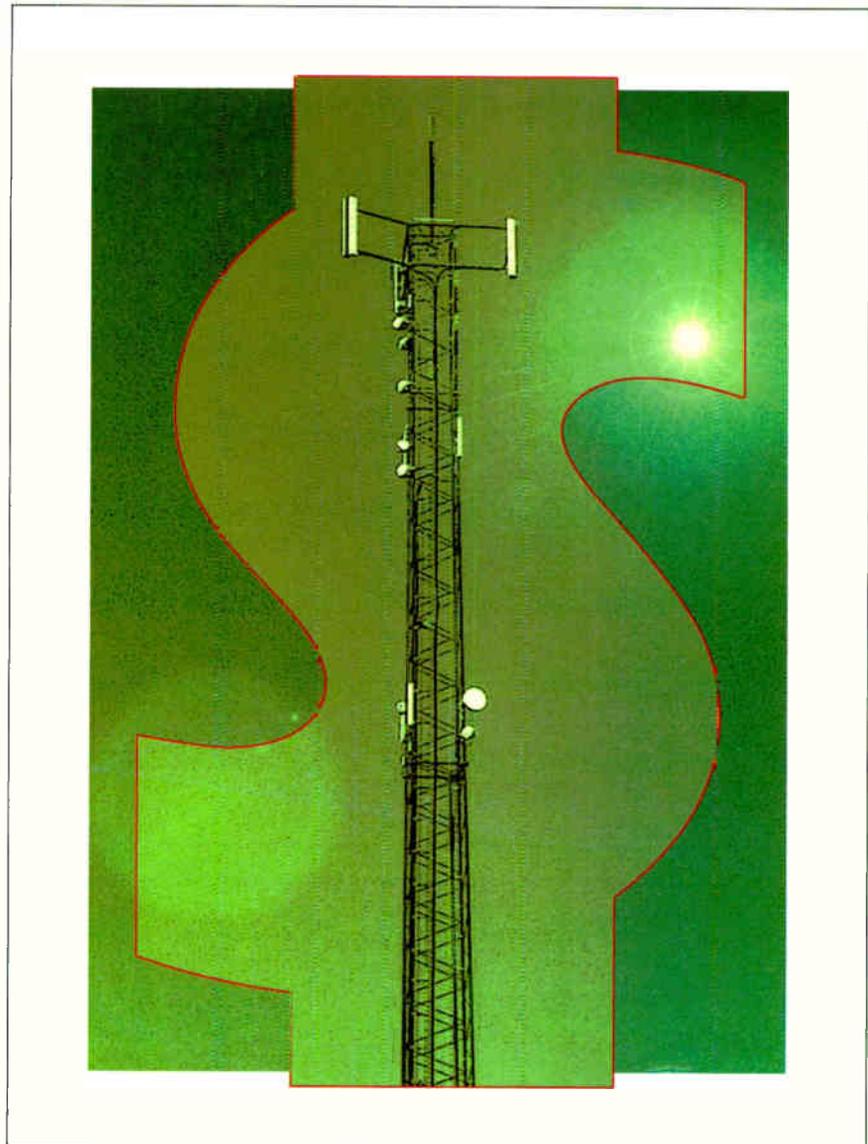
Typical OPEX costs associated with a wireless backhaul network are as follows:

- *Monthly lease costs*, which fall into two categories:
 - *Tower lease costs* — There is typically a monthly lease cost for each point-to-point antenna on a tower. This cost increases as antenna size increases. For this example, we will assume \$200, and vary the cost.
 - *Indoor space and power costs*— There is a monthly fee for each rack space and power required, which we will assume to be \$100 per month.
- *Spectrum license costs* — In North America, there is one-time license cost that covers 10 years. This cost is typically \$3,000, including coordination services.
- *Maintenance and management* — This cost is typically assumed to be an annual cost equal to about 10 percent of CAPEX.
- *Installation* — This is a one-time cost for the microwave-link installation, including line-of-sight survey and site prep. This is assumed to be \$7,500 per link.

Typical CAPEX costs associated with a wireless backhaul network are as follows:

Microwave equipment — This includes the electronics, cables, installation material and antennas. For this example, we are assuming two types of links:

- *Access links* — A < 50 Mbps link at 18 GHz or 23 GHz with small antennas due to the short access link lengths. The assumed cost is \$12,000 per link (including two ends).
- *Core links* — This is a higher-capacity link, assumed to be 300 Mbps for this example, often requiring lower frequencies and larger antennas sizes due to the longer core-link length and high modulations. The assumed cost is \$20,000 per link (including



two ends).

Ethernet Switching — Some level of Ethernet switching is required in the core for aggregation and protection. This is assumed to be at a cost of \$2,500 per switch.

For this comparison, let's assume a two-tier network model with four-link core-ring architecture. The access portion of the network is a hub and spoke, unprotected architecture. Let's assume a bandwidth requirement of 25 Mbps CIR, and 50 Mbps PIR. There are a total of 12 access links, filling the 300 Mbps network core. The assumed network architecture is shown in Figure 1 on page 48.

Based on the network model shown in Figure 1 and the cost assumptions previ-

ously discussed, we can construct a total cost of ownership. For this model, we will look at a 10-year network cost including all capital costs, installation costs, lease costs and maintenance costs. This cost breakout is shown in Figure 2 on page 50. Only 12 percent of the total network cost is CAPEX, and 66 percent of the network cost is from site- and antenna-lease costs.

To reduce the overall network cost, it becomes clear that addressing equipment cost will only have a small total effect. To get a significant total-cost improvement, the antenna- and site-leasing costs need to be addressed. This is easier said than done because of the growing demand for wireless deployments and the associated rise in leasing costs. The only way to reduce this is to plan on

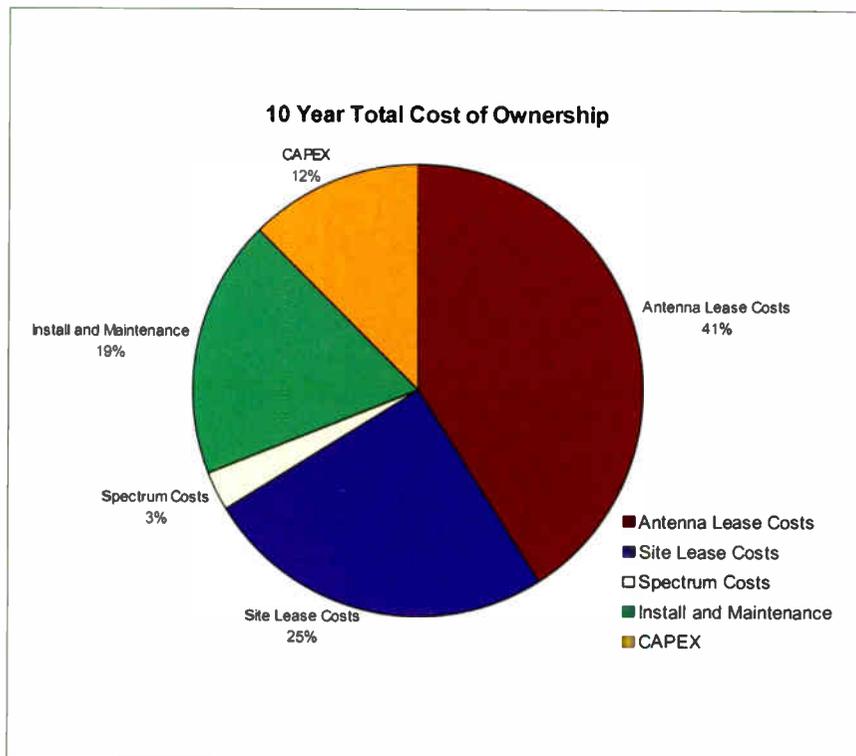


Fig. 2. Ten-year cost of ownership components.

reducing the amount of leases that are required within the network. There are two lease areas that can be addressed:

- **Antenna Leases**
 - *Reduce antenna size* — By reducing the antenna size, antenna-lease costs can typically be cut in half. Antenna sizes can be reduced, while maintaining availability, by using high-power systems, or by using adaptive modulation which can maintain connectivity during rain-fade events (at reduced capacity). These two factors can be used together to drastically reduce the antenna size.
 - *Extend WiMAX antenna panels to include backhaul antennas* — On access links, an antenna extension often can be used to eliminate antenna-leasing costs and reuse the existing WiMAX lease costs.
- **Site Leases:**
 - *Outdoor microwave equipment* — All outdoor licensed microwave



IS YOUR TOWER COMPLIANT?

New rules are coming...

A coalition of broadcasters, engineers and OEMs filed a Request for Further Rule Making to unsnarl the FCC's AM detuning rules. The Commission released the Request for comments, which have been received. Indications are that the rules changes and additions in the Request will be adopted, wholly or in part. These changes should facilitate AM detuning compliance and improve relations among broadcasters and tower owners and their tenants.

To learn more, go to www.waterfordconsultants.com and read the articles about the proposed rule changes and the impact these changes may have on you.

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equipment is now available, which eliminates the requirement for any indoor microwave equipment.

- *Outdoor switch housings* — Outdoor switch housing is available to eliminate the need for any indoor rack space at all sites.

In the sensitivity analysis below, the overall network cost effect by reducing antenna lease requirements and site lease requirements is examined. As shown, by reducing antenna sizes and providing WiMAX antenna extensions, including backhaul systems, network cost can be reduced by 35 percent. Furthermore, deploying an all-outdoor microwave backhaul system provides an additional 20 percent reduction, and deploying switches outside will provide another 5 percent cost reduction. In total, a 60-percent reduction can be realized when compared to the current network cost. Even if the CAPEX were reduced to "0," there would only be a 12 percent network-cost reduction.

In addition to the opportunities for savings examined above, there are additional options for reducing network cost with the knowledge that leasing, maintenance and installation dominate network cost. Three areas that are harder to quantify and should be considered when deploying a wireless backhaul network are as follows:

- *Consolidate backhaul installation with WiMAX base-station installation* — Reuse the installation and tower-climbing resources from the WiMAX network to drastically reduce the backhaul installation costs.
- *Consolidate backhaul and WiMAX network management and maintenance* — Consolidating the management and maintenance of the backhaul and WiMAX networks can reduce this large portion of the total network cost.
- *Design rings with antenna size in mind* — Use rings to extend the reach of the fiber PoP and to minimize the antenna sizes required.

Due to the growing bandwidth and data requirements of WiMAX networks,

wireless backhaul will be required. However, it has become apparent that the capital cost of the network architecture should only be a small part of the architecture decision, as the operating costs will have a much larger effect on total cost of ownership. Antenna size reduction and extension of WiMAX antenna structures, as well as all outdoor systems, can have a tremendous effect in reducing total network cost by

as much as 60 percent. It is important that all aspects of the network cost are analyzed in detail when selecting an architecture rather than focusing on the popular, but diminishing importance of the CAPEX number. **agl**

Greg Friesen is director, Product Management for DragonWave, Ottawa, Ontario. His email address is gfriesen@dragonwaveinc.com.



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Operational Aspects of Proposed AM Detuning Rule Changes

A probable FCC change in AM detuning rules will mean altered relationships among AM stations, the FCC, tower owners and their tenants.

by **Richard P. Biby, P.E.**

What a long, strange trip it has been.

In the early days, each cellphone company (by which I mean service providers affected by FCC Part 24 rules) owned its own towers; one tower per company, per

at the same sites. This created the new question of who would be responsible for site-based regulatory rules, such as FAA lighting and AM detuning, when multiple licensees are on a single tower.

The FAA issue quickly sorted itself out, in that the tower owner needs to register a tower with the FCC and FAA (under certain circumstances), and that the FCC licensees on the tower need to be in compliance. So, if you want to go on a tower that is not in FCC compliance, you effectively need to ensure that the tower owner acts responsibly. Thus, you are directly responsible as a licensee, but you are not responsible as a practical matter (most leasing agreements place responsibility for shared regulatory issues on the tower owner).

This is the concluding article in my “trilogy” on probable changes and additions to the FCC’s AM detuning rules, including a new Part 17 rule. If you came in late, refer to previous issues of AGL for background information and technical explanations (“Part 17 Change Will Affect You,” AGL July and “Compliance with Proposed Part 17 Detuning Rules,” AGL August/September).

If the new AM detuning rule is adopted, enforcement is likely function in

a fashion similar to agreements for FAA lighting compliance. You can’t make me, as the tower owner, comply with an FCC rule because I’m not a licensee. However, once an FCC licensee wants to locate a licensed facility on a structure, the structure must be in compliance. As a site owner, if I want multiple carriers to find my site attractive, I would be motivated to step forward and ensure compliance for all carriers.

Let’s take a quick look at how the rule might affect you, depending on your business. Three types of companies are likely to be affected: current tower owners who have experience with detuning issues; tower owners who will now have to “face the music” and address an issue previously not covered by an FCC rule section; and carriers or licensees who are trying to figure out how all of this “discussion” will affect them.

The experienced tower owner

So, let’s say you have several tenants on your tower. Over time, multiple carriers have had to comply with the FCC detuning rules, and your tower is detuned. The status of the current “detuning network” is about to become your responsibility.

Worst case, the tenants have all been “adjusting” an “existing” AM detuning network for some number of years. You don’t know whose hardware it is, or whether it is working correctly, but it is



location. That is when I first ran into the detuning rule, sometime around 1986.

Then, as time passed, those crazy PCS people wanted to be collocated

52 above ground level

about to be dumped in your lap. So, to be honest, you could probably wipe your hands free of it and pass the responsibility to your future tenants. This is, in effect, how it works now.

However, everyone in the process would like a “get out of jail free card” to go along with their time as “keeper” of the detuning network and see a single, responsible party. Because the proposed rule would focus on the tower structure itself, not the individual licensee, this is another vote for the tower company taking responsibility.

The old system of each individual carrier being responsible on a “last in fixes it” basis can still work, or at least continue to meet the regulatory requirements. One flaw with this system is that the last company to adjust the detuning network effectively negates all of the previous work. This is typically not a problem, as each new carrier is responsible for proving the tower does not deleteriously affect any nearby AM array.

Now, with the proposed rule, where the tower itself is now recognized to be the potential “problem,” will the tower companies want to coordinate AM issues? Of course, again, as the FCC relationship is with the carriers (licensees), a green-field tower will not need to comply until the first carrier wishes to locate on the site.

I envision that a tower company will keep a record of what work has been done at the site, trying to save carriers (their customers) the time and expense of repeating engineering studies and any field work.

Owners that are detuning ‘newbies’

Large inventories of towers are still owned by single-use companies and utilities. For the existing licensees, nothing will need to be done to bring a site into compliance. Compliance will need to be met as modifications to the site are made. So an existing microwave, public safety, or other service not currently required to address detuning will not need to take any immediate action.

One thing a tower owner could do to help facilitate compliance for future customers would be to determine what has been done to the tower previously: Is the site currently detuned? Whose hardware

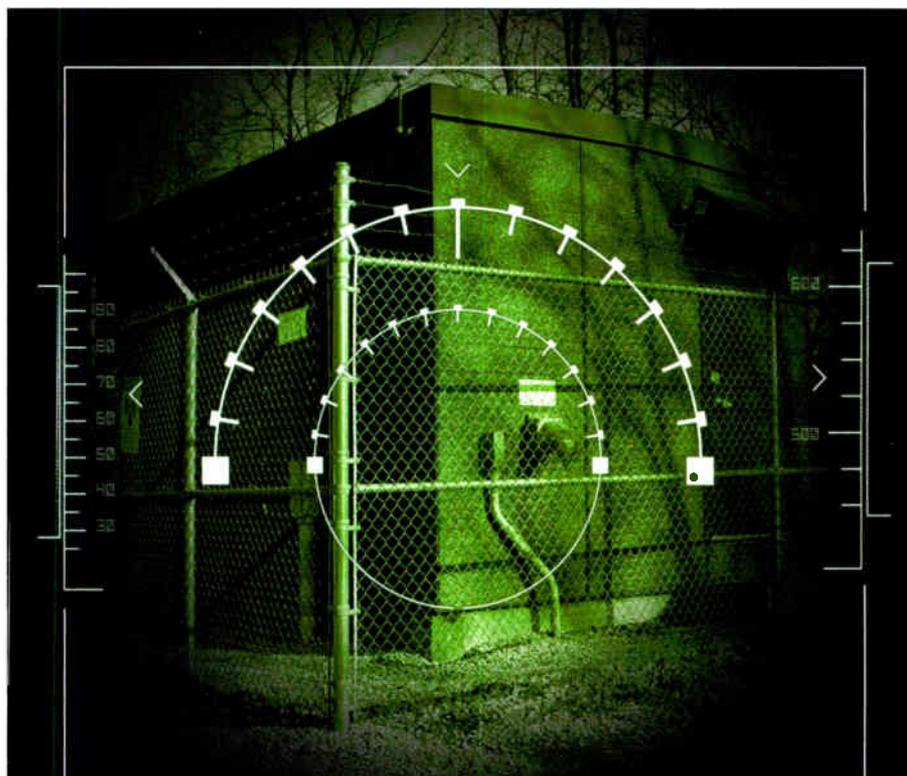
is it? Who adjusted it last? Is the network working properly?

A large percentage of existing detuning networks are not maintained, and are either nonfunctional or not properly functioning.

Another helpful activity that, honestly, is not needed until the first time the tower needs to be measured, is establishing a new baseline. As a radio station will no

longer have fixed monitor points, the notion of establishing a few fixed locations near the tower to act as ongoing “proof of proper operation” of the detuning network will need to be established.

The idea is that a few locations near the tower can be selected and established as on-going measurement locations, where energy can be quantified from both the AM station directly and from the tower. This



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will allow the ratio of direct to re-radiated energy to be established, at an accessible location, when the detuning is known to be in good operating condition.

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can have the station's personnel act as an ongoing field check "service" for you; as they live in the area, let them verify the proper operation, rather than paying consulting firms to verify operation. It will also give the local stations peace of mind, helping to make possible a quick measurement that can be made by a

station's representatives, reducing stress and costs, for everyone.

We found that the effects of a detuning network could be best quantified at a distance of $\lambda/2\pi$. This distance will be outside of just about any compound and should be conveniently accessed in just about all circumstances.

Decommissioning unneeded systems

The question will be asked by someone, sometime: "If the new quantitative method shows that a detuning network is not needed, can it be removed?" The answer is clear: "Yes."

The sad truth is that some detuning networks have been installed when a clear, mutually agreeable answer that a detuning network was unnecessary could not be obtained. Thus, absent an agreement that detuning was unnecessary, several detuning networks were installed to appease otherwise unhappy AM stations.

Because the new rules will replace the previous rules, the technical answer would be that it should be just fine to remove detuning networks where the application of the new rules says the tower does not have an effect. I would welcome an attorney's perspective on this, but I believe it will stand.

New priorities

For a few consulting companies, the future is a little bleak. The analysis I have performed indicates a large drop in the number of sites that will need to be studied, and in the number of sites that will need to be detuned. At the very least, the number of sites that would have to have some kind of before-and-after construction measurements should decrease precipitously.

Engineering consultants still have a good amount of other work to do, and the problems will not all go away, but a lot less time will be spent on AM detuning issues. Maybe I'll have time to go back to school for the M.F.A. in photography I had always dreamed about. agl

Biby (also publisher of AGL magazine) is co-founder and CTO of Waterford Consultants, Waterford, VA. His email address is: rbiby@agl-mag.com.

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PCIA Comments to the FCC

Comments on the FCC's release of the AM Coalition's Request for Further Rulemaking were filed by interested parties over the summer, and Reply Comments on the proceeding were accepted through September 7. The following excerpts are from comments on the proceeding filed in July by PCIA—The Wireless Infrastructure Association. For space considerations, footnoting and legal references have been removed. The document in its entirety can be found in the FCC's Electronic Comments Filing System and on PCIA's website, www.pcia.com.

In the Matter of Proposed Rules Permitting Antenna Modeling to Verify AM Directional Antenna Performance MM Docket No. 93-177

Comments

PCIA—The Wireless Infrastructure Association ("PCIA") respectfully submits these comments concerning a proposal by the AM Directional Antenna Performance Verification Coalition ("AM Coalition") to revise procedures for assessing the effects of tower construction on AM stations, and to consolidate those procedures under a new Part 17 rule.

Discussion

The proposed rule would require licensees proposing construction of or "significant modification" to a tower or support structure in the "immediate vicinity" of an AM antenna system to examine potential effects to the system using a "moment method analysis." Only if effects are adverse would remedial measures (i.e., detuning) be required. An effects analysis would not be required for modifications that are not significant or construction or alteration that is not in the immediate vicinity of an AM system. PCIA's concerns relate to the meaning, clarity and/or application of the terms "significant modification," "immediate vicinity" and "moment method analysis" as used in the proposed rule.

Significant Modification. Subsection (a)(1) of the proposed rule defines "significant modification" as including any change "that would alter the structure's effective electrical height by 5 degrees or more at the AM station's carrier frequency, as determined by

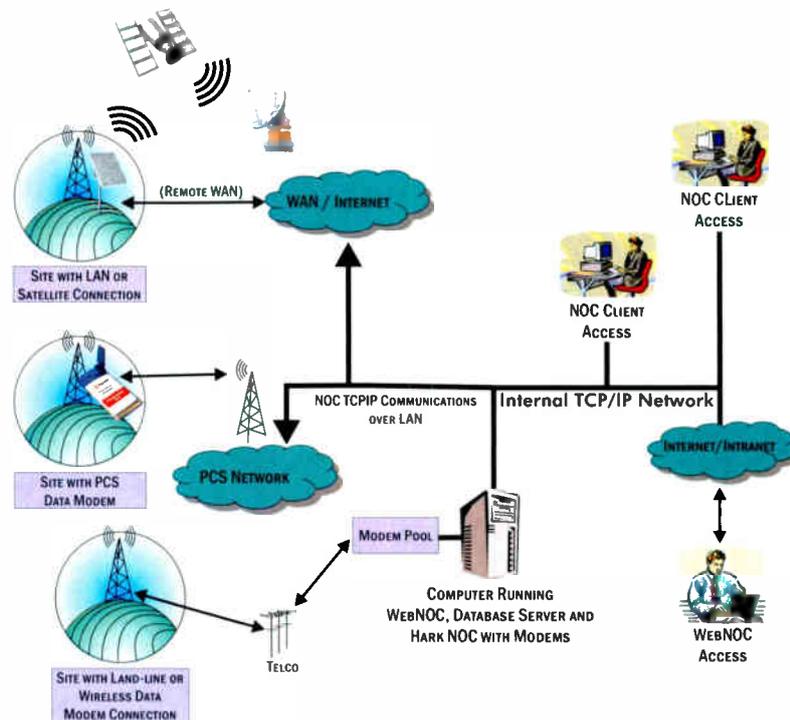
moment method analysis." Under the proposed rule, whether a modification is significant is a threshold finding that, if not triggered, means that no further analysis is required. PCIA is concerned that the "effective electrical height" determination is too complex to serve as a practical threshold criterion. As one expert recently explained, "The effective electrical height must incorporate the exact construction and characteristics of the specific tower and is therefore a unique evaluation. Determining ef-

fective electrical height can be a time-consuming and costly calculation for a tower company."

Instead, the Commission should utilize a clear, absolute value to determine whether a modification is significant. PCIA recommends that a "significant modification" be defined to include any change "that would increase the structure's physical height by 5 electrical degrees or more." The proposed 5 degree threshold would allow for the addition to (or removal from) an existing

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structure of most cellular, PCS or microwave antennas — which because of their size should have virtually no effect on an AM station — without triggering an effects analysis.

... To further enhance the ease of use of the "significant modification" criterion as a threshold determinant, the rule should incorporate "safe harbor" categories of modifications that are expressly defined as not significant. Such examples should include replac-

ing an antenna with the same type of antenna, as well as replacing an antenna with a similar antenna not more than 50 percent, or 10 feet, larger than the original antenna.

... **Immediate Vicinity.** Under subsection (a)(2) of the proposed rules, an antenna tower or support structure would be in the "immediate vicinity" of an AM system "if it is greater than 60 electrical degrees in height in the case of a nondirectional antenna, or

45 electrical degrees in height in the case of a directional antenna, at the AM station frequency, and is located at a distance no greater than the lesser of 10 wavelengths or 3 km from any element of an AM directional antenna or less than 1 wavelength from an AM omnidirectional antenna." Thus, in comparison to existing rules using absolute physical distance to determine whether an effects analysis is required, the proposed definition of "immediate vicinity" is dependent on the operating frequency of the AM station, the electrical height of the tower, and the wavelength distance between the AM station and the tower.

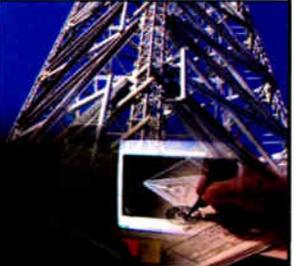
While PCIA understands the proposed rule is designed to allow for more accurate assessments of when an effects analysis is needed, it is facially more complex than the current protocol and could raise concerns for regulatory managers about its ease of application. ...[C]harts are available which can greatly simplify application of the "immediate vicinity" analysis, and that utilization of the charts requires minimal training.

... **Moment method analysis.** Subsection (a)(3) of the proposed rule states that licensees proposing to construct or significantly modify an antenna tower or support structure in the immediate vicinity of an AM system "shall examine the potential effects thereof using a moment method analysis." ... The proposed rule does not, however, otherwise define the "moment method" analysis.

While the Public Notice indicates that computer programs to predict antenna performance are generically referred to as "moment method" or "NEC" programs based on the Numerical Electromagnetics Code developed at Lawrence Livermore Laboratory in Livermore, California, additional clarification is needed. Because the proposed rule does not define the analysis or set forth the underlying assumptions, it is subject to inconsistent application. The proposal of the AM Coalition offers an opportunity to clarify the responsibilities and obligations of parties on both sides and resolve any foreseeable potential for confusion or controversy in advance. Accordingly, PCIA suggests that an industry coalition be formed to agree to and craft a best practices document. The purpose of the best practices document would be to outline the details of the "moment method" analysis to be applied, and the assumptions to be used, as a matter of industry process and practice.

agi

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Wireless Issues at the State Level

AGL magazine expands State Wireless Associations coverage and is adopted as the official publication for SWAP.

by Pat Tant

If you are reading this article, then you have made a wise choice in AGL magazine. Rich Biby and the entire staff at AGL have supported the State Wireless Association Program movement since the inception of SWAP in 2005. I am proud to announce that *AGL is now the official publication for SWAP*. It is also the official publication for PCIA, which further aligns it as the leading trade magazine to not only support SWAP, but to keep you up to date on advocacy and wireless infrastructure news.

Expanding its continued interest and dedication to cover the dynamic growth of state wireless over the past two years, AGL is committing space for SWAP news in each edition. This new section will cover SWAP events, happenings and—more importantly—the *successes* of these individual groups. You will also learn about one state each edition as we feature all of the associations chronologically.

I consider it a privilege to be a contributor to AGL and salute them for their contribution to the success of the wireless industry. We trust you will enjoy these articles and find out more about an association in your area that can service you and your organization.

Now, exactly what is a state wireless association, and what is SWAP?

State wireless associations are non-profit groups

organized to meet the local needs of the wireless industry within each state. These associations comprise any and all industry professionals who are passionate about the growth and success of wireless. All efforts that support these associations are through volunteers, and there are no dues associated with membership.

The groups meet once a quarter and benefit from a keynote speaker, enjoy networking with fellow industry leaders and discuss local industry needs and opportunities.

The first state wireless association was formed in Tennessee over seven years ago. You can learn more about the history and why there was an apparent need for such an industry voice in this month's first featured state — Tennessee (*see page 58*).

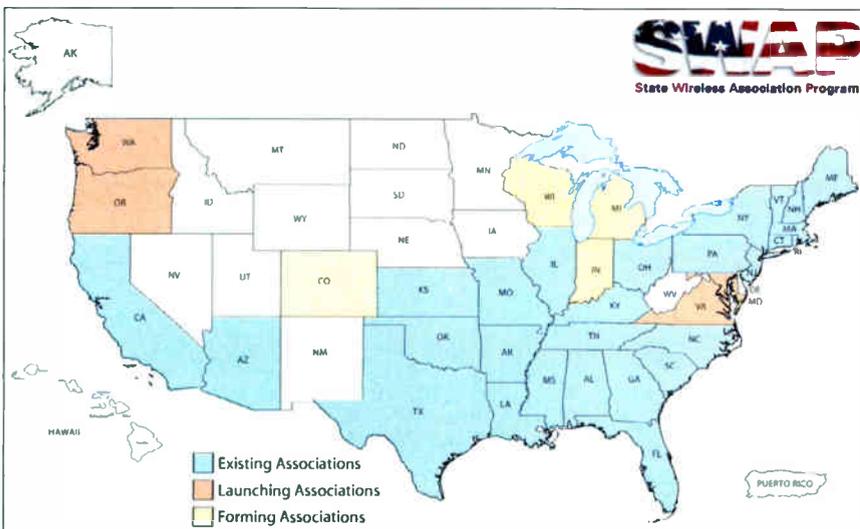
SWAP is a program facilitated by PCIA to not only continue the momentum of the associations but to provide support on a national level. This program was founded in 2005 when I realized that interest in state wireless associations was growing rapidly.

The vision to establish a local association in every state was a monumental task and would need additional resources.

PCIA, as a well established national industry association, was the obvious partner to lead this effort.

Connie Durcsak and the entire staff at PCIA eagerly assisted in the launch of this national program. PCIA has a National SWAP Director, a dedicated website, a new SWAP National Executive Committee and provides visibility at the PCIA Wireless Infrastructure Show.

Thank you for your support and involvement in SWAP. Please visit our website to learn more about a state wireless association in your area. **agl**



Tant serves as senior vice president of Birmingham, AL-based Excell Communications.

Spotlight on: Tennessee Wireless Association

Name: Tennessee State Wireless Association (TWA)

Meeting Location: Nashville, Tennessee

Date Formed: 2000

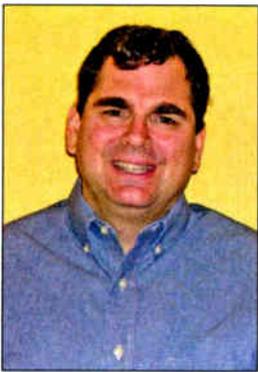
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President's Message:

The Tennessee Wireless Association was formed when a group of pioneering members recognized a need for greater communication within the industry and with local and state government. The original leaders shared a vision for state-wide cooperation in an effort to address adverse zoning climates and other issues that face and challenge our industry.

From this effort, the Tennessee Wireless Association emerged, and today TWA is over 400 members strong.

As president, it has been my privilege to continue these initial goals and to be a part of the TWA growth. It is humbling and satisfying to know that the efforts of those involved in Tennessee have assisted as a model for other associations.

We have had definite successes in Tennessee. One of which is the annual Jon Hastings Memorial Golf Tournament which raises funds for the Minnie Pearl Cancer Foundation. Another major success was in 2005 when TWA was able to pass legislation at the state level that, for the first time, set reasonable limits on the fees jurisdictions could charge for permitting communications facilities. The legislation also limited a jurisdiction's ability to impose new zoning requirements for collocations on existing towers. This victory was led by then-

president of TWA Hunter Stuart, of Crown Castle, and TWA Regulatory Chairman Nathan Ridley, of Boulton Cummings Conner & Berry. Along with two neighboring state associations, Alabama and Georgia, Tennessee has hosted two joint meetings in Chattanooga that have brought the entire south-east region together. We have also been able to bring our local industry professionals together to form relationships and unify our group within the state.

While it is with great anticipation that I look forward to both the future of SWAP and TWA, I will be moving on for other opportunities in Colorado. I am pleased to announce that Janet Gill of Excell Communications, and most recently with PCIA, has agreed to accept the role of president for TWA.

Below is our schedule of events, along with our board members. TWA has an annual set schedule in an effort to not only limit our events to but maintain our focus.

TWA Calendar/Events

March: 1st-Quarter Meeting - *Nashville*

June: 2nd-Quarter Meeting and Joint Meeting of TN, AL, GA Wireless Associations, *Chattanooga*

August: Jon Hastings Memorial Golf Tournament, *Franklin*

September: 3rd-Quarter Meeting, *Nashville*

December: 4th-Quarter Meeting and Holiday Social, *Nashville*

TWA Board Members

Vice President: Tom Scobie, Crown Castle

Secretary: Theresa Sharp, Lighttower

Treasurer: Sandra Abernathy, Boulton Cummings

Incoming President: Janet Gill, Excell Communications

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Send us your SWAP news

News, meeting notes and upcoming events releases from individual state wireless associations can be sent directly to AGL at departments@agl-mag.com.

Deadlines for including upcoming events to be publicized are the first of the month *preceding* the cover date of the next regular issue (February, March, April, May, June, August/September, October, November and December; the January *Buyers Guide* and July *Market Report* issues do not carry events listings).

State associations wishing to make sample copies of AGL available at meetings should contact Jackie Huebner, email:

jackiehuebner@excellcommunications.com.

New Jersey Wireless Association

The third-quarter 2007 meeting of the New Jersey Wireless Association (NJWA) was held September 10 in Iselin, NJ. The featured speaker for the meeting was Thomas A. Borden, deputy executive director and chief counsel for the N.J. Highlands Water Protection and Planning Council. The NJWA will be hosting its first charity golf outing on October 19 at the Royce Brook Golf Course, with proceeds dedicated to the Brain Aneurysm Foundation. Registration for the event remains open through October 12.

For registration or other information, email abarlow@cwesi.com or visit www.newjerseywireless.org.

MoKan Wireless Association

The MoKan (Missouri-Kansas) Wireless Association raised about \$13,500 for the Foundation for Fighting Blindness at its second annual golf tournament held August 21. Association president Jay Webber expressed his thanks to sponsors and volunteers who helped support the event and said, "To me that defines success, we were able to show a sense of community in the wireless industry, network, provide funding for a worthy charity and have fun at it simultaneously."

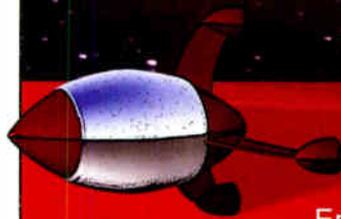
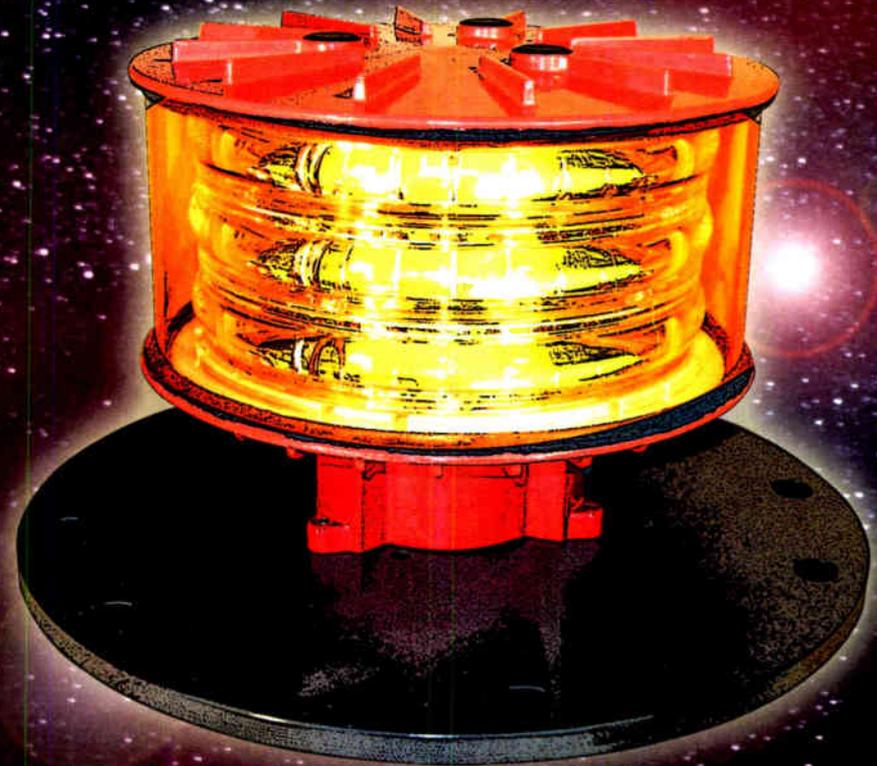
Maryland-DC Wireless Association launches Oct. 25

The executive committee of the MDDC (Maryland-District of Columbia) Wireless Association has announced the launch meeting for the new SWAP organization will be held on Oct. 25, 2007, from 11 a.m. to 2 p.m. at the Governor Calvert House, Annapolis, MD.

Keynote speaker for the launch meeting will be Maryland Secretary of Busi-

ness and Economic Development David Edgerley. A block of hotel rooms has been reserved at the Calvert House for overnight travelers. For more information about the launch meeting and membership in the association, contact membership committee co-chairs W. Marshall Knight II, mknight@sitelinkwireless.com, or Tom Worstell, tworstell@smartlinkllc.com.

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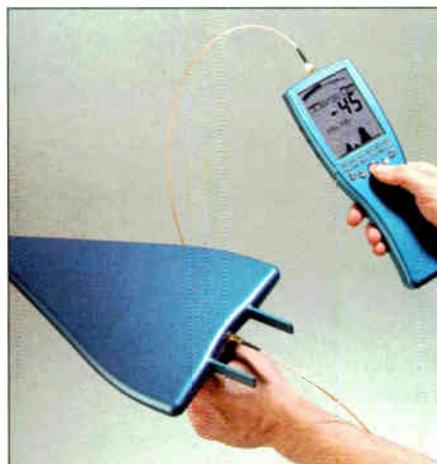
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Kaltman Creations' Spec-tran series handheld RF spectrum analyzers now span 1 MHz to 7 GHz. Some models offer optional 10 GHz peak detectors. The company's line of log periodic antennas has been expanded to include models with frequency ranges up to 18 GHz.

www.kaltmancreationsllc.com

ASSOCIATIONS

PCIA—The Wireless Infrastructure Association announced that AT&T Towers has joined the association. “We welcome AT&T Towers as a new PCIA member,” said PCIA President & CEO Michael Fitch. “AT&T Towers is a significant participant in the wireless infrastructure industry and we look forward to working with them.” AT&T Towers, formerly Cingular Sites, is a group within the new AT&T dedicated to managing a tower portfolio of over 9,500 towers. As a carrier-operated tower company, AT&T Towers has the third-largest national tower portfolio, providing collocation opportunities at locations across the United States.

REGULATORY

In a *Report and Order* issued by the Commission in mid-September, the FCC permitted Fixed Service operators in the 10.7-11.7 GHz band to install and use smaller antennas. The action allows a range of fixed microwave applications, including those that support next-generation mobile services, that were not accommodated under the existing rules for the 11 GHz band. The rule changes were proposed in a March 2007 *Notice of Proposed Rulemaking*, which the FCC adopted in response to a *Petition for Rulemaking* filed by wireless backhaul provider FiberTower. The FCC said the lower costs and enhanced benefits of smaller antennas will result in more efficient use of the 11 GHz band without harming existing users. An applicant seeking to use a smaller antenna in the 11 GHz band will need to coordinate its proposed facilities with existing users in the band. The FCC expects Fixed Service applicants in the 11 GHz band to carefully coordinate their operations with the authorized feeder link operations of any licensed geostationary Mobile Service Satellite gateway earth station in the 11 GHz band to avoid harmful aggregate interference.

In an *Order* issued by the Commission in early August, the FCC extended the effective date of the recently adopted

Did You Know?

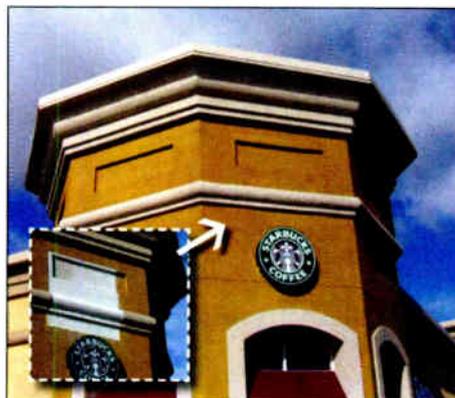
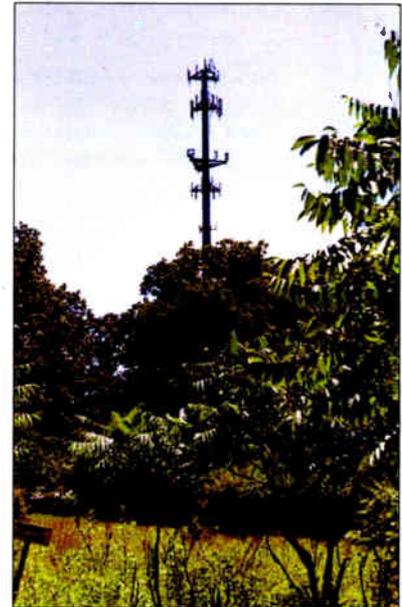
Uncle Sam Could Be Your Landlord

The General Services Administration (GSA) provides policy guidance for siting antennas on federally owned buildings and property. GSA enters into leases placing private-sector antennas and support equipment on GSA properties. GSA's nationwide antenna-leasing program encompasses about 1,900 ground and rooftop sites available for leasing.

The GSA's Public Building Service (PBS) is also the largest public real-estate organization in the country. PBS has an inventory of more than 342 million square feet of workspace for 1.1 million federal employees in 2,100 American communities. This space is distributed among more than 1,500 government-owned buildings.

The antenna program offers the siting industry several advantages. Located in nearly every metropolitan area, most GSA facilities have 24-hour security, minimizing the threat of vandalism or theft. In addition, GSA's guidelines for antenna-siting and lease contracts are streamlined to reduce time and paperwork. GSA's network of antenna-leasing specialists coordinates antenna-siting needs with qualified providers.

Starting in 1989 with four broadcasting lessees located on the Old Post Office Tower in downtown Washington, the National Antenna Program was extended in 1995, when President Clinton signed an Executive Memorandum directing federal agencies to assist the wireless communications industry in locating and securing sites for antennas.



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backscatter

Section 12.2 of the rules to October 9. This rule ("Katrina Panel Report Generates FCC Back-up Power Requirement," AGL, August/September 2007) requires local exchange carriers and commercial mobile radio service providers to have an emergency backup power source for assets normally powered from local AC commercial power, including those inside central offices, cellsites, remote switches and digital-loop carrier-system remote terminals. The rule further requires that LEC's and CMRS providers should maintain emergency back-up power for a minimum of 24 hours for such assets. LECs that meet the definition of a Class B company, as set forth in Section 32.11(b)(2) of the Commission's rules, and non-nationwide CMRS providers with no more than 500,000 subscribers are exempt from this rule. The rule was to have gone into effect on August 10. The FCC's postponement of the effective date was triggered by a *Motion for Administrative Stay* filed by CTIA—the **Wireless Association**. The Commission is using the additional time to consider issues raised by CTIA in its motion and to hear from other concerned parties on the emergency power requirements.

TOWERCOS

In mid-September, Boca Raton, FL-based **Global Tower Partners** (GTP) announced the acquisition of 549 communi-

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cations towers from AT&T. The towers are located in 27 states across the United States. Financial terms of the transaction were not disclosed. RBC Daniels acted as financial advisor to AT&T in the transaction. GTP owns or master leases more than 7,700 sites, including more than 2,600 owned towers throughout the United States. GTP's customers include Sprint-Nextel, AT&T, T-Mobile, Verizon Wireless, US Cellular, Metro PCS, Leap Wireless, Clearwire, Centennial Wireless, Dobson Communications & ALLTEL Communications.

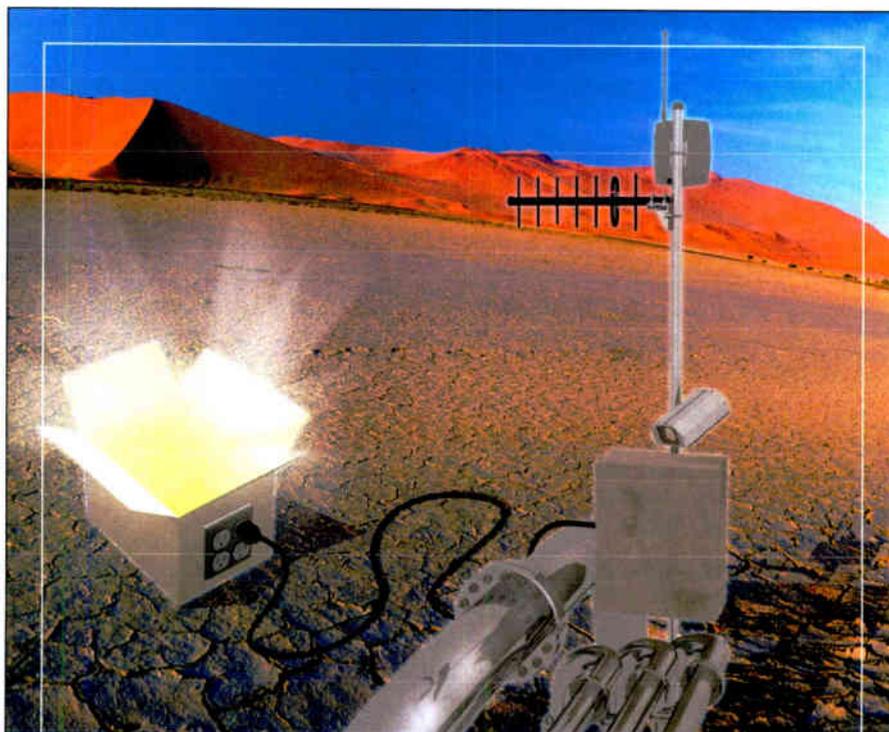
Boston-based **American Tower (AMT)** announced in early September that it has entered into a new \$500 million senior unsecured term loan credit facility. The company expects to receive net proceeds of approximately \$498.5 million from the new term loan and will use about \$450 million to repay certain existing indebtedness under the company's continuing senior unsecured revolving credit facility. As a result, AMT will have \$550 million outstanding under its existing \$1.25 billion senior unsecured revolving credit facility. The new term loan has a term of five years. AMT owns and operates over 22,000 sites in the United States, Mexico, and Brazil as well as about 2,000 revenue-producing rooftop and tower sites.

In other AMT news, the company announced that **Amit Sharma** has joined the company as executive vice president for Asia. Sharma will serve as president of the company's Asian operations and will be based in the AMT's new office in Delhi, India.

Diamond Communications has acquired **Southeast Towers**, a communications tower portfolio company of Seaport Capital. The acquisition adds a portfolio of 180 tower assets to Diamond's portfolio, expanding Diamond's operations across the Southeastern United States. The towers are located in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. The price of the acquisition was not disclosed. "We are excited about this acquisition," said Ed Farscht,

CEO of Diamond Communications. "Southeast has a strong portfolio of well-positioned assets. This purchase is consistent with Diamond's strategy to expand its business through both new tower development as well as strategic acquisitions." Bob Tamashunas, principal of Seaport Capital, said, "The entire Southeast Towers team accomplished a lot over

the last three years in building one of the largest privately held tower-development companies in the country. We believe Diamond Communications will be a solid business partner for Southeast, going forward." Seaport Capital provides equity to middle market media, telecommunications, information and business services companies with a focus on private



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companies with market capitalizations between \$15 and \$200 million and equity needs of \$5 to \$35 million. San Francisco-based **Media Venture Partners** served as exclusive financial advisor to Southeast Towers and Seaport Capital in this transaction.

BUSINESS BRIEFS

The impending discontinuance of LDF cable products from **Andrew Corporation** has prompted industry distributors to forge deals with the company to keep LDF5 and LDF7 cables available to telecom customers. Andrew is streamlining its Heliac cable product portfolio by discontinuing its LDF series cable and featuring alternative products. Additionally, Andrew will cease regular production of LDF5 and LDF7 series coaxial cables at the end of 2007, with equivalently sized Heliac Andrew Virtual Air AVA and HELIAX AL aluminum series cables serving as direct replacements.

Santa Fe Springs, CA-based **Talley Communications**, a distributor of wireless communications infrastructure and mobile products announced an agreement with Andrew that allows Talley to continue to distribute Andrew's LDF cable products. Mark Talley, president of Talley Communications, said the distributor welcomes the opportunity to continue to offer the LDF series of cables to its customers due to its importance to providing customer support. Carrollton, TX-based **Hutton Communications** has negotiated with Andrew to continue the availability of the LDF products through the Hutton distribution network. Hutton will continue to offer all of the various styles of LDF cable that has become a staple in the wireless industry. "Customers have become accustomed to relying on the LDF series of cables, and Hutton will be able to continue to offer these to customers moving forward," said Rick Guipe, senior vice president of sales for Hutton.

In other **Hutton** news, the company

announced it will distribute **EION Wireless** products to the Canadian and United States markets. In April 2006, EION Wireless acquired product lines from Calgary-based Wi-LAN. The VIP 110-24, Ultima3 wireless radios and the Libra MAX WiMAX platform will now be available through Hutton Communications distribution. EION Wireless products operate in licensed and unlicensed frequencies and are used by businesses, telecom service providers, governments and enterprises to deliver high-speed wireless communications. EION specializes in creating products that enable high-speed Internet access, VoIP, data network extensions, and wireless data and telephony backhaul.

In further **Hutton** news, the company announced Hutton Canada will distribute **Advanced Antenna** products to the Canadian market. Portage, MI-based Advanced Antenna manufactures antennas for wireless broadband and other wireless applications. It offers seven

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antennas for enhancing the performance of Motorola Canopy and antenna solutions for 900 MHz to 5.85 GHz, including WiMAX. Its products include 10 different parabolic grids, yagis, sectors and omnis.

Two telecom companies are among those placed on the first list compiled by *Inc. magazine* of the 5,000 fastest growing U.S. private companies. King of Prussia, PA-based **Weintraub Telecomm (WeiTel)** ranked 816 on the list with a three-year sales growth of 420 percent. Houston-based **TWR Lighting** ranked 3,497 on the list with a three-year sales growth of 84 percent. The 2007 *Inc.* 5,000 list, an extension of the magazine's annual *Inc.* 500 list, comprises many businesses that are too big to grow at the pace required to make the *Inc.* 500, as well as a host of smaller firms. The list measures revenue growth from 2003 through 2006. To qualify, companies had to be U.S.-based, privately held, independent (not subsidiaries or divisions of other companies) and have had at least \$200,000 in revenue in 2003 and \$2 million in 2006. WeiTel designs, deploys and manages voice, video and data networks for cable television operators, telecommunications providers, wireless operators and selected commercial customers. In addition, it provides customer support services for original equipment manufacturers (OEMs) that sell products in those markets.

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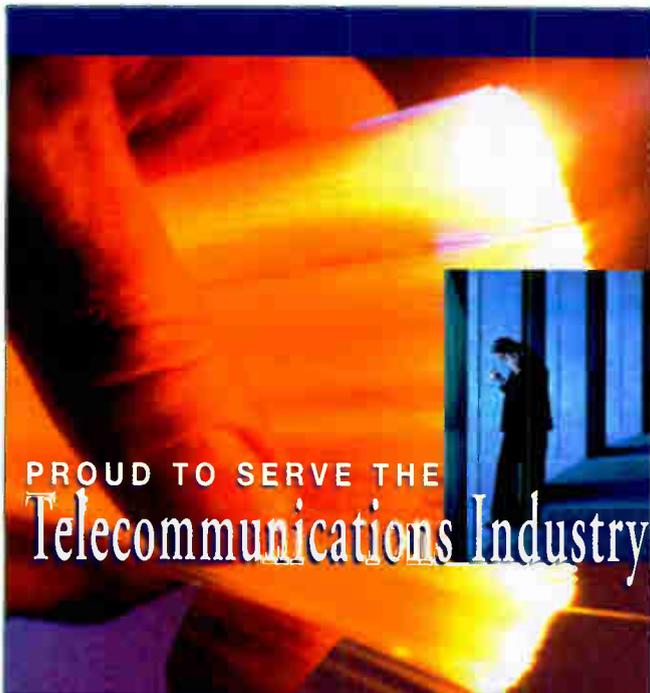


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TWR Lighting is a 26-year-old, privately held Texas corporation that designs, engineers and manufactures aviation obstruction-lighting systems for wireless communications, broadcast towers and other applications. A breakdown of *Inc.*'s overall list indicates the ranking of "hottest" regions for fastest-growing companies are: the Midwest, with 1,046 companies; the West, with 884 companies; the Southeast, with 872 companies; the Northeast with 782 companies; and the Mid-Atlantic region, with 606 companies.

San Jose, CA-based **NextG Networks**, a provider of Distributed Antenna System (DAS) networks, launched its most recent DAS network in Carlsbad, CA, in less than five months. The network covers parts of Encinitas, CA, and allows current and future wireless carriers serving the area to provide both municipalities with upgraded wireless performance. Although such systems can require a year or longer to launch, NextG credited the short buildout time to its status as a Competitive Local Exchange Carrier, navigation through rights-of-way procedures, experience partnering with carriers and municipalities, and technical innovations. NextG builds, owns and operates DAS networks using

strategically placed low-power, fiber-optic-fed nodes that blend with the surrounding landscape by using pre-existing street lights and utility poles.

Greenville, NC-based **LBA Group** has launched a "blogsphere" specific to the wireless and radio-frequency industries. The LBA Blogsphere is populated by three blogs. Blog content will be contributed by experts from the LBA companies, employees, customers and invited industry contributors. "As the LBA Antenna Turns" focuses on RF equipment such as AM antenna systems for broadcasters, low- and medium-frequency equipment for DGPS, NAVTEX and the navigational world, RF-test equipment and radio systems integration and support. "See No RF Evil—Hear No RF Evil" offers views on radio-frequency hazards, wireless security, electromagnetic compatibility and RF regulatory compliance over a variety of industry segments including cellular, broadcasting, wireless IT and academia. "Antena LBA Hispana" is in Spanish with technical content specific to Latin America and Spain, including a sampling of both other blogs.

The blogs provide updates on LBA's products, employees and customer applications as well as insider perspectives on industry news. RSS feed

subscriptions are offered. Web surfers can select the blog of their choice from the Blogsphere at:

<http://www.lbagroup.com/blogsphere/>.

LBA Group companies provide technical support for infrastructure assets of the radio frequency and wireless telecommunications communities. The Lawrence Behr Associates consulting portfolio includes electromagnetic interference management, RF shielding, AM detuning, RF hazard and safety compliance. LBA Technology manufactures broadcast and communications antenna equipment, radio frequency shielding systems, and components.

Austin, TX-based **KGI**, a marketing and licensing firm for the wireless industry, announced that **Michael P. Hennigan** has joined the company as executive vice president. Before coming to KGI, Hennigan held the position of executive vice president of operations with Global Signal in Sarasota, FL. Following Global's merger with Crown Castle International in January, Hennigan continued in that role supporting the transition until joining KGI in August. Hennigan's initial area of responsibility will be helping KGI secure additional tower clients. KGI Wireless markets and licenses more than \$2 billion of land, building and tower assets. It has 10,000 sites covering 80 percent of the major wireless markets in 3,600 cities and 48 states. **agl**

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Correction:

Our "Tower of the Month" located in Delaplane, VA, as featured in the July AGL centerspread, was incorrectly identified as being owned by Invisible Towers. Waterford, VA-based Invisible Towers provided camouflage wrap for the monopole and supplied the photo to AGL. The tower is owned by Boca Raton, FL-based Global Tower Partners (GTP). AGL regrets the error. *(We're also impressed that, with 7,700 sites to keep track of, Terry Armant of GTP noticed it was one of theirs.)* **agl**



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A Lot of Cause and Little Effect



This time last year, when I selected “regulation” as this issue’s theme, I supposed we might have one article on the subject. Instead, we discuss the EPA in Julia Custer’s column, OSHA in the lead feature, local zoning codes in Ed Gazzola’s article on tower specs and AM detuning rules in Rich Biby’s article—with related news in the “back of the bus.”

These articles focus on *specific* regulations. I want to turn up “the noise factor” about the *process* of regulation.

by D. A. Keckler, Managing Editor
dkeckler@agl-mag.com

The FCC walked into a hornet’s nest with the back-up power rule in its *Order* based on Katrina Panel recommendations. The essence of what the Commission wants is a good idea. Every telecom site is potentially critical infrastructure, emergency power is useful and service continuity is a good deal. Where the FCC ran afoul of the industry was in saying, essentially: “This applies to almost all of you, and get it done in 60 days.”

Reasons this is not practical can be found in the *Motions for Administrative Stay, Petitions for Reconsideration and Comments* filed in the last two months by PCIA, CTIA, major carriers and just about anyone else that owns a lawyer. The pages, stacking up like cordwood, speak to the issues involved, so I don’t need to reiterate them here. T-Mobile notes that it can’t order generators yesterday for 37,000 sites, which most of us can understand.

What does perplex me, despite 14 years covering this industry, is why no one ever directs comments toward the section in the appendix of an *Order* that is *supposed* to address such issues before they *become* issues.

I’m talking about the regulatory flexibility analysis. I can only assume most members of the Federal Communications Bar Association have lapsed into complete despondency over the FCC’s version of this, and they just don’t try to punch a hole in it anymore.

An Initial and a Final Regulatory Flexibility Analysis are incorporated, respectively, into *Notices of Proposed Rulemaking* (NPRM) and final *Orders* issued by the Commission (and other agencies). These sections are there not just to support the paper industry, but because a law says, in essence: “Every time you propose a rule, assess the effects it will

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have on small business and explain either how it doesn't impose unreasonable requirements or why you couldn't avoid it." ("Small business," by the government's definition, covers just about all of you with fewer than 1,500 employees.)

An ornery ombudsman

The Office of Advocacy of the Small Business Administration is the intramural watchdog ensuring that federal agencies comply with the Regulatory Flexibility Act (RFA) of 1980, subsequent amendments in the Small Business Regulatory Enforcement Act (SBREFA) of 1996 and applicable current *Executive Orders* of the sitting president.

Advocacy sends an annual "report card" to the president and Congress on how well federal agencies are complying with the RFA. It notes—repeatedly—that the FCC fills in all the lines on the RFA essay test, but, often as not, fudges the question of what the result will be. As a substitute for analysis, the FCC

employs out-of-date boilerplate about how many businesses there might be in each of its licensee categories. This is further obscured by linking the possible number of affected small businesses to historic levels of auction participation.

There is a reason why there are a lot of bad demographics but little supposition about a rule's effects. Advocacy repeatedly draws attention to the reason in the report card. In essence, it's hard to assess a probable effect when a proposed rule—isn't one. There is an ingrained timidity at the FCC about issuing a document called a *Notice of Inquiry*. You know: "We're thinking about making a rule, but we need more information from the people regulated or affected. So what do you think?"

Instead, the Commission, often as not, jumps straight to an *NPRM*, without really defining therein the rule it might make. This makes an *NPRM* really hard to comment on—and even harder for the FCC staff to intelligently

assess the impact on *any* business or licensee, let alone small ones. This is compounded by rules being written—or not—at the bureau level without orchestration of format throughout the FCC.

The FCC maintains, dubiously, that because it is an independent agency, not all regulatory flexibility provisions, particularly those in *Executive Orders*, apply to it. Consequently, we get the motions of "regulatory flexibility" without much "analysis."

The FCC also has a bad habit of sending copies of proposed and final rules to Advocacy for review *after* adoption but *before* they see print in the *Federal Register*. Letter of the law is met; spirit of the law is wanting.

So, communications attorneys may be rightfully despondent about challenging the way RFA sections of FCC *Orders* are constructed. You can lead a horse to water, but if you can get it to roll over on its back and float, you've accomplished something. **agl**

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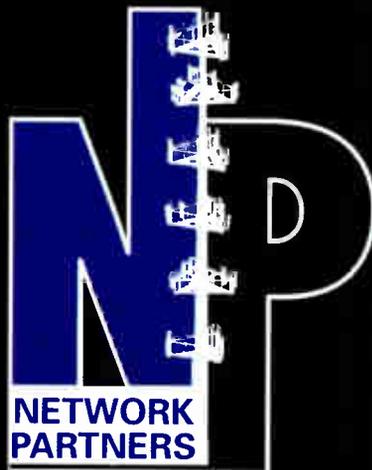
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