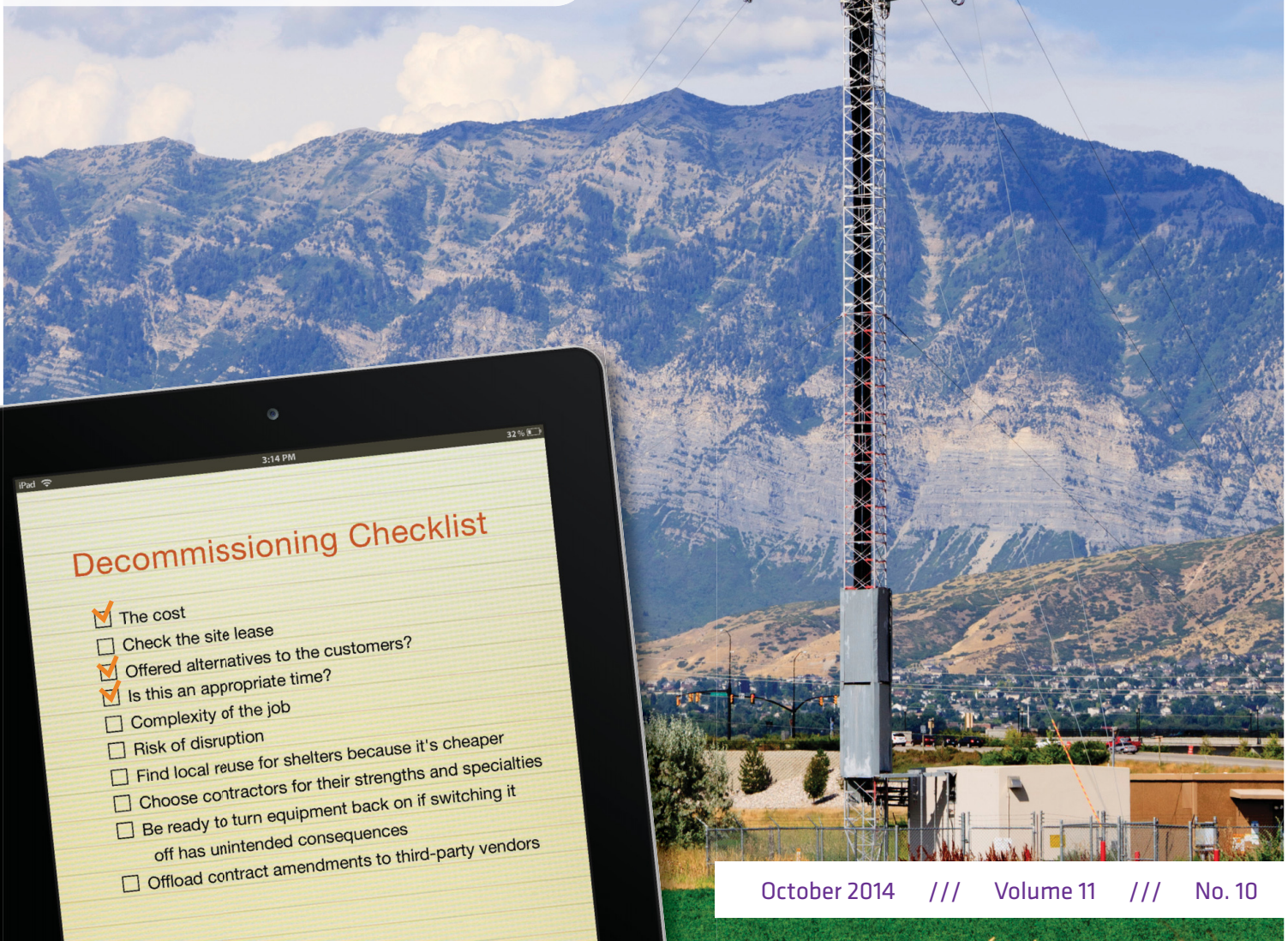


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CELL SITES SPECIAL ISSUE

- Negotiating Cell Site Lease Renewals
- Cables and Connectors
- Decommissioning Cell Sites



Decommissioning Checklist

- The cost
- Check the site lease
- Offered alternatives to the customers?
- Is this an appropriate time?
- Complexity of the job
- Risk of disruption
- Find local reuse for shelters because it's cheaper
- Choose contractors for their strengths and specialties
- Be ready to turn equipment back on if switching it off has unintended consequences
- Offload contract amendments to third-party vendors

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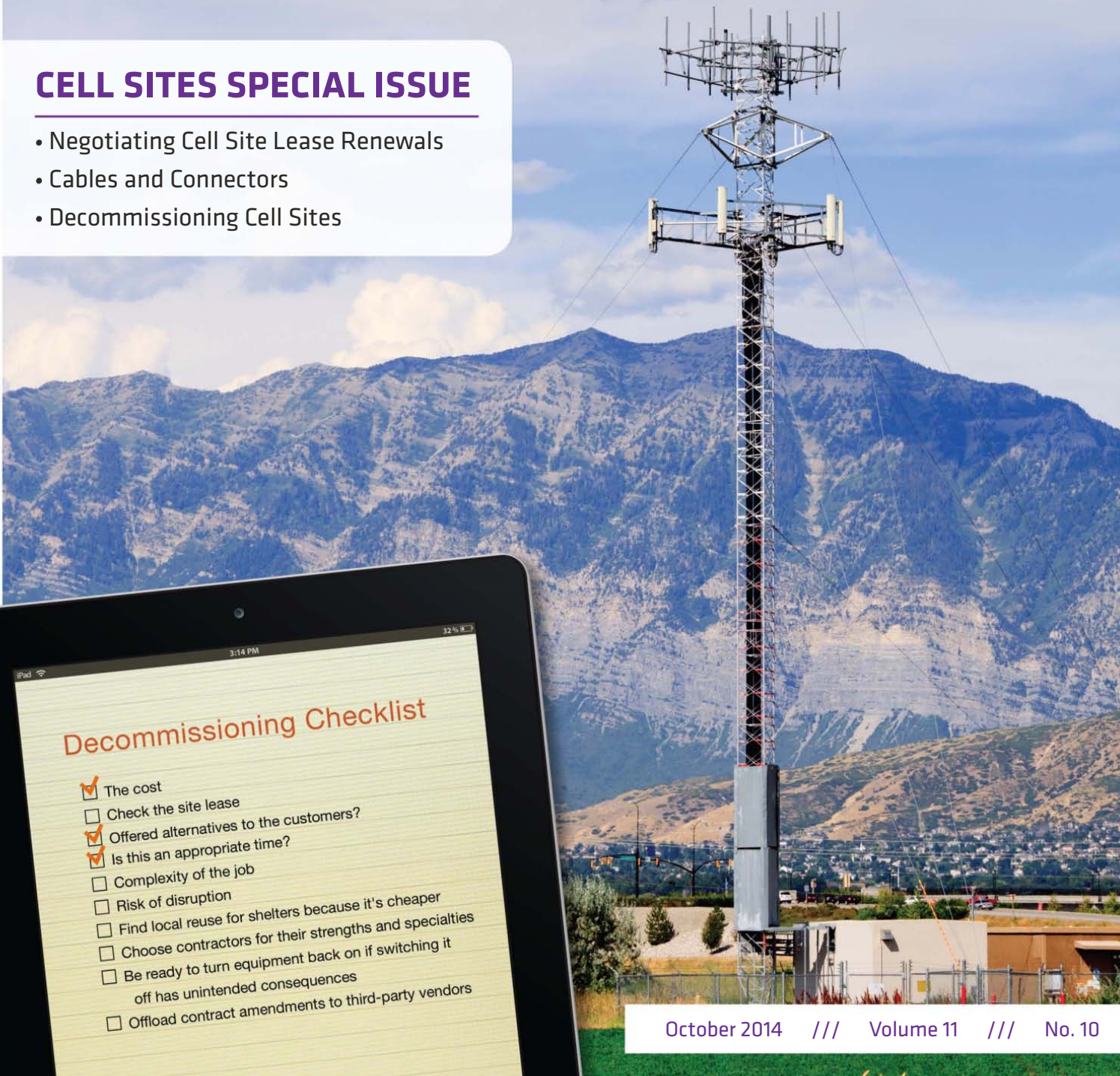
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38

FEATURES

- 18 **What it Takes to Decommission Wireless Network Cell Sites**
by Don Bishop
- 26 **AGL Tower of the Month**
Photography by Paul Wrablica
- 30 **Current Issues in Negotiating and Updating Cell Site Lease Renewals**
By Lynn Whitcher
- 34 **Are Small Cells Overhyped? The Case for Macrocell Tech Densification**
By J. Sharpe Smith
- 38 **New Research Helps Explain Why Climbers Fall**
By Bill Siuru, Ph.D., P.E.

DEPARTMENTS

- 04 **Editorial Comment – Assistance for Tower Climbers' Families**
By Don Bishop
- 06 **Publisher's Note – Small Cells = Small Returns?**
By Richard P. Biby, P.E.
- 08 **Company Profile – New Tower Company to Support Cell Site Densification**
By J. Sharpe Smith
- 10 **Buyers Guide – Quick-Guide to Collocation and Acquisition Companies**
- 44 **Product Showcase – Cable and Connectors**
- 50 **Advertiser Index & Professional Directory**

Assistance for Tower Climbers' Families

Just in time to include word of it in this issue, the Tower Family Foundation formally announced its launching at a reception held by the National Association of Tower Erectors (NATE) during Super Mobility Week in Las Vegas.



Also announced was an initial donation of \$400,000 to the foundation by ClearTalk Wireless and its legal representative, the Fletcher, Heald & Hildreth (FH&H) law firm. Work to establish the foundation began more than a year ago when ClearTalk and FH&H approached NATE about establishing a charitable foundation to provide financial assistance to family members of severely

injured, permanently disabled or deceased tower workers injured or killed in accidents stemming from working at heights on communications structures and other qualifying accidents. Details are available at www.towerfamilyfoundation.org.

Among organizations helping tower climbers' families, the new foundation joins the Hubble Foundation, which was established in March 2012.

We applaud the efforts of both foundations to help the families of tower climbers.

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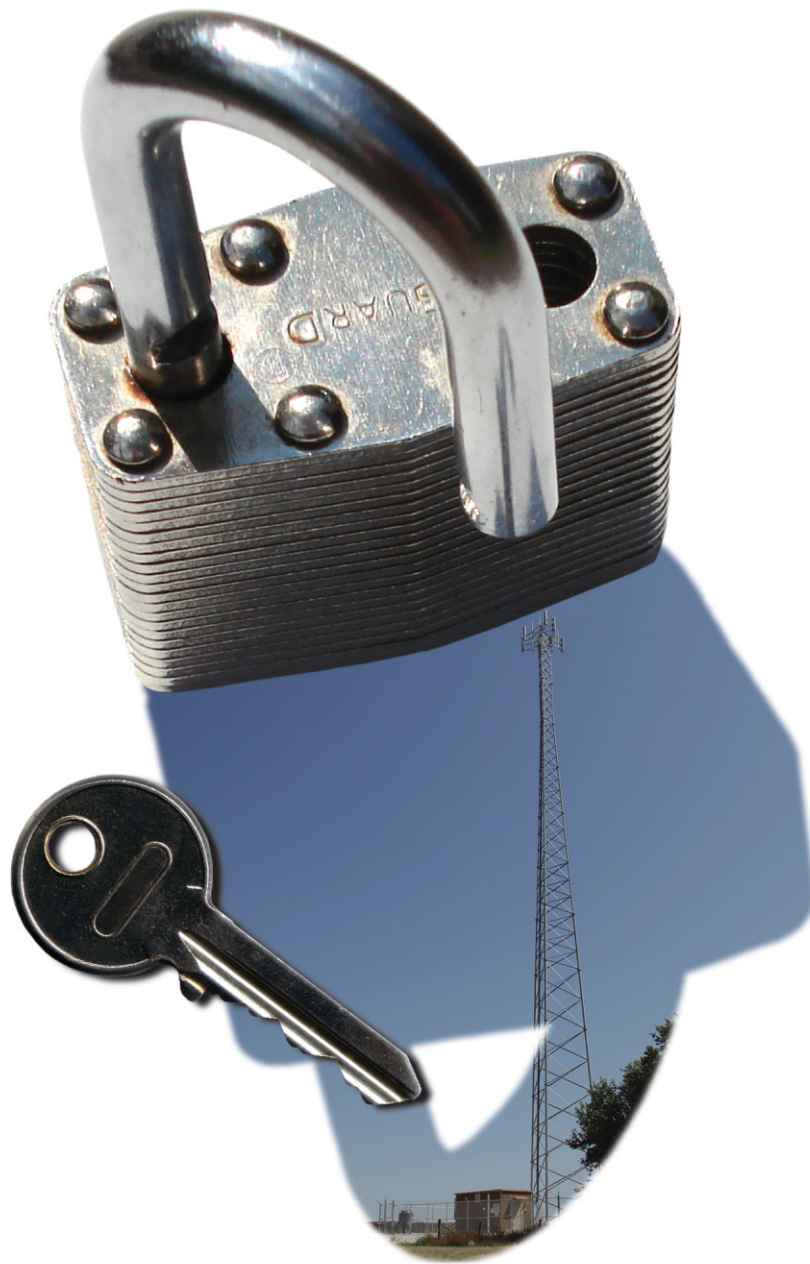
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Members of the Tower Family Foundation board of directors and board of advisers at the National Association of Tower Erectors reception during Super Mobility Week in Las Vegas, where the launching of the foundation was announced. *Photo by Don Bishop*

EDITORIAL COMMENT



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Small Cells = Small Returns?

In September, I spoke at the Tower & Small Cell Summit collocated in Las Vegas with Super Mobility Week powered by CTIA. A topic



that kept coming up was whether small cells were real. Many of the usual suspects in the tower world say that in their view, small cells are not being requested

in the way traditional cell sites are and, thus, they are not perceived as real.

Small sites are real, and countless small sites are being deployed. The reason you don't see them in the tower industry is that carriers are not sharing small sites the way they share towers. Today's small sites are inexpensive enough that carriers are happy to not have the complications and perceived added expense of a middle layer. For the present, hiring a company to program and manage the necessary site acquisition, zoning and deployment and then paying outright for the tower (Or shall we call it a pole?) is simply the most direct way to get the job done.

This situation will change. A site, with power and backhaul, is too valuable to only have one carrier located on it. Just as Crown Castle International has recognized the value of fiber and recently made a splash with its acquisition of 24/7 Mid-Atlantic Network, tower companies will come to realize the value of the small site, the potential for collocation or simply the annuity value as carriers eventually will want

to cash out on their investments in these sites.

I don't see tower companies getting out in front of the demand anytime soon and building small sites on speculation; they are not unique enough to have enough value — a small site is easy enough to build that investing too much in hopes of finding the right location where a carrier will want to collocate seems risky. However, as we've seen before, there is often a good return or reward for a company willing to get out ahead of the demand and take a chance. That would be either site acquisition companies and professionals or smaller tower companies. It's what I would be doing right now. Each site may be worth less than our old friend the 199-foot monopole; however, with less risk, and with easier deployment and greater numbers still come returns. A small site does equate with a smaller return. But here you *can* make it up in volume.

Don't look down!

Wow! After last month's article about my tower climbing experience (virtually none) and taking the three-day class with JP Jones of Safety LMS, I must say thank you to the many people who have written me with their stories. So many folks have shared stories of the early days of the industry, their first experiences climbing and some funny stories of their being scared to death the first few times up a tower. I owe quite a few folks some thank you notes. Few things seem to have struck a chord quite like this. Thanks for the comments, everyone!

VoLTE

We were all a little surprised when Verizon announced the availability of VoLTE. This is the next step toward the dream of more unified communications. It is expected that the demand for VoLTE services will require an additional 20 percent network usage of LTE just for data. No carrier turns off an old technology the day a new one is turned on, so expect it to take a number of years for carriers to roll out applications on new 4G devices to VoLTE. It will take time. However, eventually this migration frees up spectrum used by the less-efficient 3G technologies, and the cycle of technology upgrades begins again.

I'm looking forward to some of the applications that we iPhone elitists have enjoyed for years. The new iOS update supports VoLTE applications. IP-based SMS and FaceTime-like applications for other devices will be exciting additions to our old standard expectations of a smartphone. It will be fun to watch how the carriers and device folks manage to integrate Wi-Fi offload into a seamless, application-driven experience — handing off a phone call in session between the LTE network and an available Wi-Fi access point. This is not going to change the world, but it is fun that so much that we've been talking about for so long is finally coming together.

Rich Biby, Publisher
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New Tower Company to Support Cell Site Densification

By J. Sharpe Smith

Two cell tower industry veterans, Tom Remillard and Jim Rech, have teamed with Peppertree Capital Management to form Blue Sky Towers, which will focus on developing and managing wireless infrastructure with an interesting mix. Two-thirds of the sites will be on rooftops, and the other third will be new towers.

“We want to be a specialist in cell site densification, which is where we see a lot of opportunity right now, as a lot of the growth is in the urban core, and there is a need for assets,” Remillard said. “With small cell development, outdoor DAS, the key components to the wireless ecosystem are existing rooftops.”

Remillard is CEO of the new company. He was formerly principal of Wireless Realty Advisors. Rech is president. He was formerly vice president of development at Global Tower Partners, which sold its U.S. tower portfolio to American Tower.

Peppertree Capital Management, which is an equity investor in Horvath Towers, committed \$80 million in debt and equity financing to Blue Sky Towers to fund 700 to 800 cellular sites in the next five years. Rooftops in the top 20 metropolitan areas and tower development in the peripheral markets will be Blue Sky’s focus.

“We are already on the ground corralling real estate owners in these

areas,” Remillard said. “Rooftop development is reflective of where carriers are voicing the need. We want to help the carriers solve the problem of building out a network on existing rooftops in urban areas.”

Remillard said that rooftops have many of the same obstacles as tower site development, including zoning, permitting and leasing.

“Instead of planting steel in the ground, you are putting thousands of pounds on a rooftop. You have to deal with structural issues and in-building conduit and getting fiber to a facility, which is unique to rooftop deployments,” he said.

Cell Tower Development

While Blue Sky won’t shy away from creative, opportunistic acquisitions, the focus of its fund is building new towers.

“We feel like there is already a lot of money out there chasing tower aggregation,” Rech said. “Moving forward, development of new towers is really our sole focus, similar to my focus at GTP.”

Build-to-suit contracts will be a

big focus in Blue Sky’s new tower development.

“I spent a lot of time at GTP developing relationships with all the carriers. We will also do rooftop-to-suit, reconditioning the rooftops to make it easier for them to deploy,” Rech said.

Currently, Blue Sky has 10 employees with a plan to expand to 30 in the near future. It will outsource all parts and construction of the sites through relationships with local markets. At the end of five years or when it hits its cell site goal, the company will assess the possibility of a tower sale.

Rech joins other GTP alumni jumping back into wireless infrastructure development. Dagan Kasavana, who ran the mergers and acquisitions department for Global Tower Partners, has started his own venture, Phoenix Tower International, focusing on acquiring, developing, owning, leasing and operating cell towers in Latin America. Meanwhile, Marc Ganzi, former GTP CEO, is plotting his next moves through his wireless infrastructure investment firm, Digital Bridge Management.

“Rooftop development is reflective of where carriers are voicing the need. We want to help the carriers solve the problem of building out a network on existing rooftops in urban areas.”

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Quick-Guide to Collocation and Acquisition Companies

As a supplement to AGL Magazine's January Buyers Guide, a list of collocation and acquisition companies offers more detail to help you choose a vendor for your next project. Where shown, logos and company descriptions were provided by and paid for by each company.



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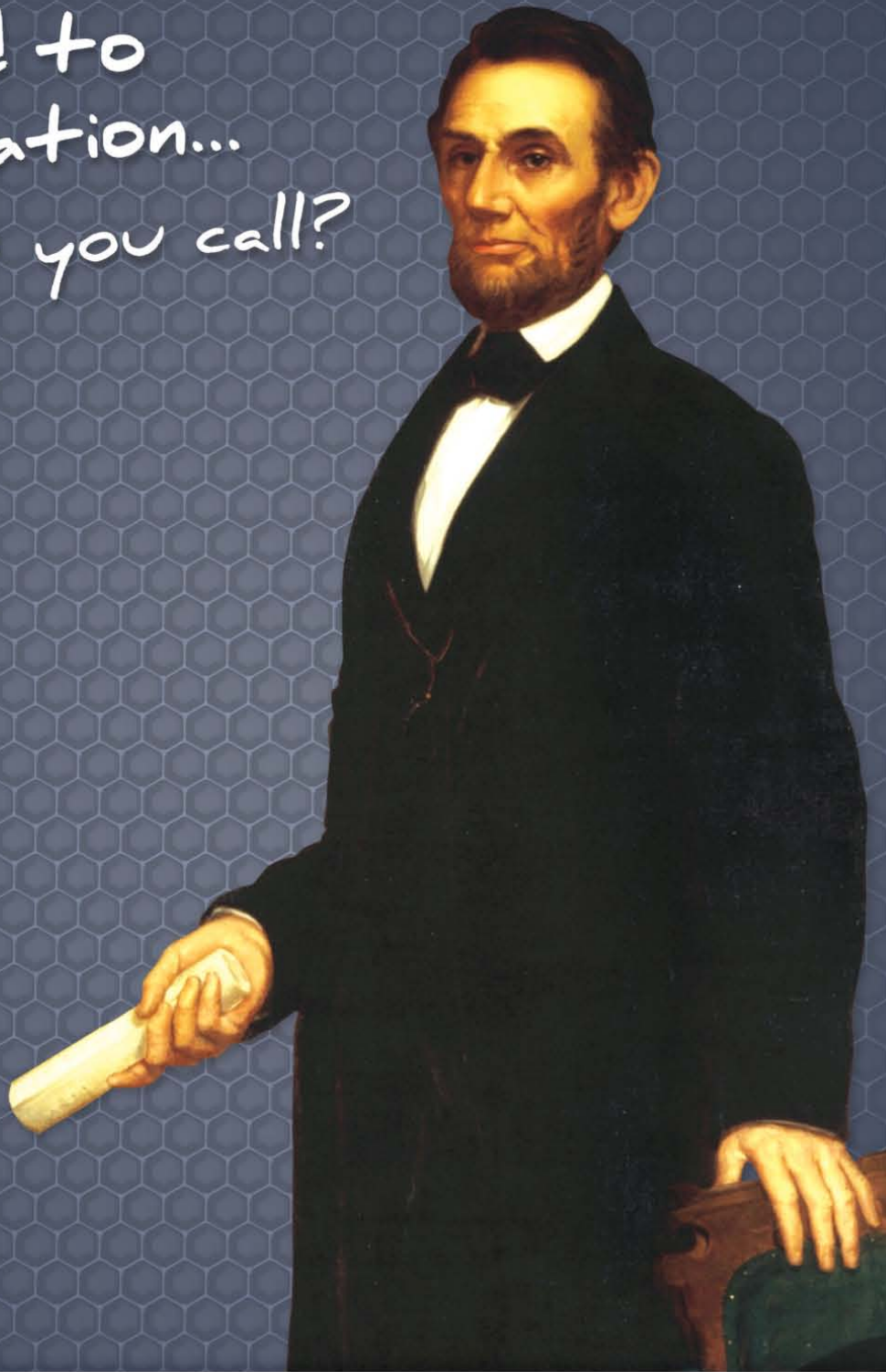


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What It Takes to Decommission Wireless Network Cell Sites

From disposal to recycling and reselling, decommissioning cell sites poses a sometimes massive, unbudgeted challenge to wireless network operators. Here's how contractors handle the projects.

By Don Bishop

For several reasons, contractors partially or entirely decommission cell sites for wireless carriers and site owners. They remove equipment and either destroy it, recycle it or sell it, depending on supply and demand. If shelters cannot be donated for use by others, they often are destroyed or donated to local organizations because the market for used shelters is poor. Sometimes electronic equipment is placed into inventory for the same carriers that are decommissioning sites if other sites in the network still use the same technology and if replacement parts otherwise have become difficult to obtain.

Partial site decommissioning takes place when carriers upgrade sites to new technology, such as upgrading from CDMA to LTE. For a time, a site may have to have both technologies in operation, and then contractors come in to remove the equipment used with the older technology. In other instances, sites are entirely decommissioned and the contractors restore the land that the sites occupied to the condition it had prior to the site construction.

"We're working with operators all

over the world today to help them think through, plan out and manage their network decommissioning programs," said Dan Hays, a principal at PwC, a professional services firm.

Network Operators

Hays said that although network operators have put together robust organizations to build, operate and maintain networks, they have less ability when it comes time to decommission them. "No one that we've met has built an organization to take stuff apart," he said. "That's where the opportunity is, to help operators with what for most of them is a first-time-ever opportunity to plan effectively and economically for an end-of-life cost that most of them don't ever think about."

Lisa Hanlon, chief executive officer of Teltech Communications, a worldwide supplier of network, wireless and wireline equipment and services that processes equipment received from decommissioned cell sites, and Doug Presti, project manager at Goodman Networks, a company that designs, builds, optimizes and maintains wireless networks and that

fields contractors that decommission cell sites, offered perspectives about cell site decommissioning that will be detailed, too.

PwC surveyed wireless and wireline carriers all over the world about decommissioning, and three-quarters of them said they were going to decommission one of their networks. The evolution from 2G to 3G and 4G technology motivates much of the decommissioning because carriers don't want to manage multiple networks, Hays said. They want to use more efficient technologies and thereby reduce operating cost. Power consumption, spectrum usage and space requirements for new equipment are less than they are for older technologies.

Reducing Failure Rates

Besides those factors, Hays said some of the decommissioning activities are motivated by a desire to reduce equipment failure rates. "Some mobile networks have existed for 10 to 15 years," he said. "Failure rates are going up. We're seeing the end of life of some generations of equipment — lack of availability of spares and replacement parts. One operator told me some



Dan Hays, a principal at PwC: "We're working with operators all over the world today to help them think through, plan out and manage their network decommissioning programs."



Doug Presti, project manager, Goodman Networks: "Landlords are figuring out ways to continue to get their checks because at the end of the day, that's what it's about."



Lisa Hanlon, CEO of Teltech Communications: "The key material is the high-theft components such as coax and batteries that have value. That's what we manage from the decom perspective."

cards for base stations tripled in cost in less than a couple of years, making it uneconomical to simply replace them as they failed."

Hays pointed out that the eventual transition to voice over LTE, which he said would take some time, will lead mobile network operators to question their continued operation of legacy voice networks that use older technology.

Speaking about carriers that re-deploy equipment obtained through decommissioning cell sites, Teltech's Hanlon said that in a large decommissioning project, a carrier saved close to \$400 million of capital expense by reusing its own assets for capacity growth. The carrier harvested legacy equipment during a 4G deployment that it used to provide additional network capacity. Reusing existing towers and cell space helps with site acquisition and leasing, thus, decommissioning accelerates the deployment of the next-generation network.

Each week, Teltech receives as many as 50 semi-trailer truckloads

of decommissioned equipment in its distribution center in Colorado. General contractors bring the decommissioned material to one of Teltech's 38 in-market warehouses, where the company uses its inventory management software to track the equipment to the site level. It uses locked containers for the coaxial cable. Teltech manages lead-acid batteries it receives all the way through to the battery smelter to the point where the recycler issues certificates of destruction.

Program Management

Goodman Networks' Presti said that as his company has been removing a large, nationwide network, the requirements of the new network that replaces it help to set the priorities. The first sites targeted for the new network then become the first sites to decommission. Next, Presti said he looked at cost savings that could be obtained by fully decommissioning sites and eliminating the carrier's rent payments to landlords. "Sites with long-term leases that cannot be

broken come in at the end of the project," he said.

Presti said he has attorneys on his site acquisition team to fight attorneys who represent landlords as they navigate through the contracts. "When you're ending a contract with somebody, you have to put yourself in their shoes," he said. "They've been receiving a check every month for 10 to 20 years, and that's getting shut off. Some landowners have let our workers into the site where they started work, only to have the landowners lock them out of the site and refuse to return their tools. We've had police called on our crews. We've had landlords set us up. We scheduled cranes, the cranes showed up, and then the landlords shut us down. By doing that, they force us to keep paying rent. Landlords are figuring out ways to continue to get their checks because at the end of the day, that's what it's about. It's about them getting their money, and we're cutting that."

Presti said his company goes by the contract and has been known to

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At the Teltech Communications facility in Colorado, pallets of communications equipment await testing to determine the equipment's condition and for a decision whether to resell or recycle. Photo courtesy of Teltech Communications

DECOMMISSIONING

have legal battles with landlords to get sites removed. He said the work itself is not that difficult, but dealing with landlords sometimes can be. He contrasted dealing with large tower companies versus dealing with mom-and-pop landlords. "With large companies such as Crown Castle International or American Tower, negotiations are straightforward," he said. "They're just moving around and shuffling" among existing sites with collocated antennas. He said the mom-and-pop landlords present Goodman Networks with the biggest challenge.

Opportunity

Hays said active decommissioning offers some carriers the opportunity to increase antenna counts and install microwave equipment for backhaul, which can add to the rent roll for the

landlord. Instead of trying to terminate the leasing contract, he suggested that carriers should think about what else they may need, what else they may offer to their landlords, such as a future installation of 4G equipment.

"Sequencing the decommissionings, planning them for the appropriate time and knowing what levers you can pull are important to getting the decommissioning done and avoiding some confrontations that might otherwise occur," he said. "We hear stories ranging from weapons being drawn on people to fences being cut. It's never pretty, but it's really no different than any other landlord-tenant relationship."

Dealing with the large volume of contract amendments associated with network decommissioning can overwhelm site acquisition teams.

Offloading the work to a central location with third-party vendors that set up fax pools to receive, scan and inventory approved contract amendments helps to take the workload away from the site acquisition teams. This frees them to negotiate the contract amendments while leaving the tactical paperwork to others.

Network Customers

Decommissioning a network has some pitfalls. Operators don't like to shut down networks until customers using them have migrated to the operators' alternatives, such as an upgraded technology. "We had a client with a million customers left on its network the day it was shut down," Hays said. "All of the customers had been contacted, notified and offered alternatives, and yet they hung on until the

very last day that the network was live. That isn't rational."

Enterprise customers, especially those with in-building systems that need to be upgraded and need to have older equipment that uses older technology removed, may have built applications and services on top of their devices and the communications service that's being provided. They don't want to lose those apps and services. Hays told of a network operator that served some sensitive government facilities where the users wanted years to migrate. "They had to be heavily financially motivated to get them off of the network in time for the decommissioning," Hays said. "Otherwise, the operator would have had to keep the entire network going across the country."

Unintended Consequences

Sometimes contractors affect backhaul when they decommission a network. Presti said a lot of the backhaul that is supposed to remain functional may run through traffic switches where the operator is not aware of it. When the switches are removed as part of the decommissioning, the backhaul may suffer failures. Sometimes backhaul microwave equipment on towers that are decommissioned is

not for stand-alone sites, but instead it serves as repeaters on which the rest of the network depends. "That's when we have to get into a quick reactionary mode to get the stuff turned back up," he said.

Contractor Selection

Presti said he runs four groups of contractors, each with its strengths and specialties. He said it is important to keep the logistics organized and to assign the right crews for the various tasks. The removal, transportation and disposal of batteries have environmental requirements. Whether radio and transmission equipment in the shelter can be reused or have to be recycled makes a difference. Dealing with the antennas and coaxial cable calls on a special set of skills. The shelter, concrete pads, ground-mounted cabinets and telephone company equipment involve certain steps and procedures.

"As far as the shelters are concerned, originally when the large network decommissioning project we're working on now started, we were able to resell them," Presti said. "There's been such a glut, we are now just destroying them, putting them into dumpsters and getting rid of them that way, the proper way. The air

conditioners were being evacuated and recycled. But most of the time, the concrete buildings are being destroyed." Presti said Goodman Networks asks nearby city governments whether they might have a use for the shelters. "If they do, we just ask them to come pick them up," he said. "It's free of charge, and then they get the good shelters."

Some network operators would prefer to abandon sites and leave it for the landlord to deal with the shelter, coaxial cable and antennas. Doing so usually involves negotiating such an arrangement with the landlord, and Presti said that's where the lawyers on the site acquisition team come in.

"We know how much it costs for a full decommissioning," Presti said. "If you can leave the shelter, that saves a certain amount of dollars. You can give that as an incentive to the landlord. A lot of times, what we try to negotiate is to have us remove the antennas and coax but leave the boom gates at the top of the tower. That's something the landlord could then turn around and re-lease. What we're trying to do is tell him, 'Although we're leaving, we're trying to set you up for a good position for the next guy.' But some landlords are stubborn and want the stuff removed. It sometimes costs a couple of hundred thousand dollars to remove shelters from rooftops. We had one on top of a school that required the use of a 350-ton crane. And then you get into timing of when the school was out. So, if we can negotiate it down, we do."

Reuse or Recycling

Companies such as Teltech Communications play a role in decommissioning

Priorities for selecting sites to decommission

1. Sites to be upgraded for LTE
2. Sites to be completely shut down and the real estate reverted to the landowner
3. Sites with long-term leases that cannot be terminated

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The reuse of battery and power cabinets for solar power may not have any applications for cell sites, but it might find a home in the oil and gas industry. *Photo courtesy of Teltech Communications*

recycler or to a battery smelter. When the cabinets arrive in Colorado, the company scans the information into the carriers' own internal systems so they can track their assets.

At the central facility, Teltech sorts what needs to be kept for special events, refurbishment and spares. The rest is deemed to be resalable; however, Hanlon said so much surplus equipment is reaching the resale market that reselling equipment is becoming increasingly difficult.

To deal with the increase in recycling, Teltech created a subsidiary company, Genesis Green, which handles the recycling for what Teltech can't resell. "We micro-break down the cabinets," Hanlon said. "We crush the cabinets, and then they go directly to the metals recycler. We break down all the electronic waste to a point where we take all the casings off to get the highest value back for our customer and to ensure that it doesn't end up in a landfill or in another country. At our new site, Genesis Green, we try to repurpose the battery and power cabinets, and we just developed our first solar prototype. We're trying to determine how to reuse the assets in another way, maybe not for cell sites, but perhaps for the oil and gas industry."

when it comes time to handle the equipment removed from cell sites. Hanlon said general contractors bring the equipment to her company's in-market facilities, with a possible exception of lead-acid batteries. If sites are powered down in wintertime and the batteries aren't removed at that time, they can expand and leak. If that happens, Teltech sends a team to deal with the site and the hazardous material.

Other than that, when general contractors bring equipment to the Teltech facility, Teltech palletizes the cabinets. "The key material is the high-theft components such as coax and batteries that have value," Hanlon said. "That's what we manage from the decom perspective, what we're responsible for."

Teltech supplies general contractors

with pallets, shrink wrap and cardboard to take to the cell sites. They pull the batteries from the cabinets and palletize the batteries because they can't transport cabinets with batteries inside. Teltech warehouses the batteries until a full truckload accumulates before sending them to the recycler and obtaining the certificate of destruction.

Forecasting

Using its software, Teltech forecasts what equipment it expects to receive each month by market and by cell site ID. To track cabinets, it scans bar codes on cabinets as they arrive at the warehouse. Everything eventually winds up in Teltech's central facility in Colorado. It uses bar codes and scans containers for coax and batteries, which either go to an in-market

Improper Recycling

A nightmare scenario for some wireless network operators involves improper recycling. As Hays explained, "A carrier executive once said to me, 'My nightmare is that my gear that's in my cabinet with my bar code on it, my name on it, winds up dumped in a lake or winds up tossed in a field and somebody finds it and then it's attached to me even if I wasn't the one handling it.'"

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Hanlon said Teltech takes care to see that recycled materials are properly managed. “We’re R2/RIOS-certified,” she said, referring to certification to a combination of the Responsible Recycling (R2) Practices and the Recycling Industry Operating Standard. “We manage recycling downstream to the actual certificate of destruction. We’re responsible to make sure that materials do not end up in landfills. We try to cut out the middlemen and send materials directly to recyclers.”

From Teltech, batteries go directly to smelters. “The electronics recycler that we’re using doesn’t use smelters in foreign countries,” Hanlon said. “The waste stays in the United States where it’s processed by a new technology to break out the precious metals even further. We ensure that it doesn’t leave the United States.”

Destination for Cabinets

Cabinets that Teltech crushes go directly to the aluminum and steel buyers. With e-waste, Teltech micro-breaks down equipment, removing casings and cables, and sends the result to its chosen recycler.

Hanlon said the end customer audits Teltech, and that Teltech in turn audits its recycling partners to ensure compliance.

Presti said that for the large network decommissioning project his company is handling, Goodman Networks has a zero-landfill policy. He said that the high price for recycled metals contributes to keeping them out of landfills, but high prices have a negative effect, too. “The negative is that theft from cell sites goes up,” he said. “The positive is nobody’s throwing this stuff in the lake. The aluminum is up



Teltech Communications' first solar prototype repurposes battery and power cabinets. Photo courtesy of Teltech Communications

50 cents to 60 cents a pound. When we pull these radios and have to dispose of them, that’s good money, a lot of money when you start adding up the weight. Finding creative ways to recycle it helps to obtain the maximum amount of money out of it. So in one sense, high prices for metals are bad, but in another, they’re actually helping to keep the environment green by reutilizing metals.”

Hays said many wireless network operators throughout the world have been surprised to find that decommissioned components have little or no resale value. “When the process starts, they say, ‘Oh, my network, it’s worth so much money. I’ll take it down and I’ll ship it to Latin America or Southeast Asia.’ They’re expecting hundreds of millions of dollars in residual value to offset the cost of the decommissioning. The reality is that the market for used and aged wireless

equipment is surprisingly small,” he said. “The reality is that largely Asian suppliers of new equipment offer low-cost, energy-efficient, compact equipment together with financing, and this has killed the market for much of the used equipment to be redeployed. Especially if it has increased failure rates and higher power consumption, used equipment is a tough sell in emerging markets.”

Tax and Inventory

The tax collector may look favorably upon network upgrades that involve decommissioning if the steps are properly documented, Hays said. The advantage involves structuring the upgrade for a like-kind exchange that defers taxation. “A lot of network operators’ chief financial officers are getting on top of this now because they realize that this is an opportunity to do things right,” he said.

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“When upgrading a network, carriers can take some credit against the cost of what they’re pulling out at the same time, so there’s a good opportunity for carriers to create some additional value through decommissioning,

offset the cost and get a better handle on assets. Most of the operators that we talk to typically said they’re lucky if 60 or 70 percent of their assets are accurately catalogued in their asset-tracking systems. It makes

decommissioning difficult, but it also means that if they get the old, inaccurate stuff out, they have an opportunity to reset and do it right for the future.”

Opportunity and Concerns

In summing up, Hays said PwC sees a lot of opportunity and a lot of concerns in decommissioning. “Cost is a big concern,” he said. “A lot of investment is required to take out tens of thousands of sites with dozens of trucks showing up each week. Decommissioning is not free, and it’s often something that network operators don’t plan for. Nevertheless, it’s a great opportunity, especially for those who can offer efficient, innovative decommissioning services.”

Complexity

Hays said a second big concern has been the complexity, with tens of thousands of projects and multiple contractors on each project, and logistics to coordinate. “Most of the operators aren’t set up to do this on a large scale,” he said.

“And then finally, there is the risk of disruption,” Hays said. “The last thing you need is to take out a fiber ring that’s serving the rest of your network or take down a critical microwave link. These are not small problems for the operators. We’ve seen some lack of care at times that’s caused disruption during decommissioning programs.”

This article is based on remarks that Dan Hays made as moderator and Lisa Hanlon and Doug Presti made as panelists at a session during the Wireless Infrastructure Show in May.

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Current Issues in Negotiating and Updating Cell Site Lease Renewals

A combination of critical provisions, rights of refusal, expansion and termination rights, along with other helpful but optional provisions, make up cell site leases often desired by wireless carriers.

By Lynn Whitcher

You can't build a cell site without leasing or owning property. When negotiating a lease agreement for a new site, a carrier generally takes the time to review each contract term. But when it comes time to renew that same agreement, too often busy project managers are juggling multiple and conflicting deadlines because of an expanding list of impending expirations. In order to cope, they triage their workload by focusing narrowly on rent and extension options. As a result, the actual terms and conditions of a renewal are often dictated by the landlord's needs and desires. This mindset results in the loss of an important opportunity to reexamine the contract terms and update the agreements to bring them into compliance with the inevitable changes in network leasing guidelines implemented in the 20 to 30 years that have passed since the inception of the lease.

So, what should the carriers look for in an ideal lease renewal? (The following information addresses a range of potential business benefits and risks that may be present in a

typical telecommunication lease. Carriers should consult with counsel to understand how state law or other considerations may factor in.)

Critical Provisions

As essentials of daily network operations, these provisions are characterized as "must haves" because they are critical to the day-to-day operations of the network. A carrier is likely to utilize these rights and protections on a frequent basis throughout the lease term.

Use: The permitted use should be broad enough not just to cover the current, actual use of the site, but also future advances in technology.

24/7 Access: The ability to readily access the site 24 hours per day, seven days a week, for inspection, repair and maintenance is critical. This is because technicians may want to service a site when customer usage is at its lowest from 2 a.m. to 5 a.m. When a landlord demands prior notice of access, try to establish mutually agreeable requirements. Even landlords that initially request advance notice of site access will generally agree to no notice during regular,

defined business hours; after hours access pursuant to prior written notice for routine inspection, repair, maintenance and upgrades; and emergency access at any time, subject to reasonable notice, even if provided afterward. If telephone notice is permitted, it helps to have the landlord contact telephone number inserted into the lease for ease of reference.

Lease Administration

Because the carrier will bear the burden of most administrative provisions in the lease, the practical aspects of administering a national real estate portfolio will affect provisions in the lease agreement.

Automatic renewals: Telecommunication leases have relatively short terms, often five years. Thus, automatic renewals help avoid the need to manually prepare and mail hundreds of renewal letters across the country each year.

Fixed rent escalators: Although Consumer Price Index-based rent escalators are common in many leases, the reality is that these provisions are extremely difficult to administer correctly. Moreover, many CPI provi-

sions are poorly drafted, often failing to take into consideration that it can take anywhere from 30 to 60 days for a CPI figure to become published.

For illustration, let us examine a CPI escalator for a March 1, 2014, adjustment, for which the parties have agreed to use the most recent CPI published. At the time a carrier is calculating the rent increase, probably sometime in the middle of February, the March CPI has not been published, and neither has February's. It is possible that January's CPI might not be published yet. If, then, the December 2013 CPI is used, which CPI do you compare it with — March 2013 (one year before the anniversary date)? December 2012 (twelve months prior to December 2013)? What happens when the January 2014 CPI is published after the carrier cuts the March 1, 2014, rent check but before March 1? Does the January 2014 CPI figure become the most recent? Does the carrier need to recut the rent check? Will the landlord even notice? Fixed escalators alleviate the administrative burdens presented by these often complex and convoluted lease provisions.

Updated notice addresses and provisions: Whenever a lease is amended or extended, the carriers will confirm the landlord and carrier notice addresses in the lease are current. This helps ensure the parties do not waste time with returned mail or rejected courier deliveries when sending a notice. Also, the methods for delivery of notice must make practical sense. Some lease administrators prefer the option to send notices by overnight courier as opposed to certified mail. Some refuse to accept notices by facsimile or email. Also,

The time spent in careful management of lease renewals will pay off for the carriers in the long run by keeping their operating expenses in check.

landlords must realize that it can take days for a notice to be routed from the main office to a local office. Therefore, very short notice provisions are not practical in the context of telecom.

Limited period for site plan review: Ideally, landlord approvals would not be required for routine equipment upgrades and additions within the premises. However, in the event that landlord review and approval cannot be avoided, carriers will often impose protocols for landlord review so that project deadlines can remain on track. The lease may provide that landlord approval will be deemed to have been granted where the landlord fails to respond to a request for approval within a certain period of days after receipt of the request.

Documentation required by taxing authorities or auditors: The Internal Revenue Service has strict documentation requirements relating to the identification of third parties such as landlords who receive monetary payments such as rent. The carriers may also look at local tax requirements in addition to federal requirements. For example, in addition to requiring an IRS Form W-9 from a landlord, tenants leasing California properties may require local state forms to confirm whether withholdings on rent payments (applicable to payments to out-of-state landlords) may be required.

Auditors may also have strict

documentation requirements. Therefore, the carrier may contractually require a landlord to provide such documentation as a precondition to receiving any monies under the lease. In other words, no documentation, no money. There is no greater motivator for compelling delivery.

Limited period for reimbursement requests: The lease may contractually prohibit landlords from submitting late demands for reimbursement so as to avoid the situation in which a carrier faces a demand for reimbursement going many years back.

Acceptable tenant insurance obligations: Both at lease inception and at renewal, the insurance provisions will be reviewed. It is not uncommon for a carrier's ability to comply with insurance requirements to change over the long life of a telecom lease. For example, a lease may require that a tenant provide a certificate of insurance that provides that 30 days' notice of termination or cancellation be given to the landlord. However, the insurance industry has changed the certificate of insurance forms to remove this language. Therefore, a modification to the certificate of insurance requirement may potentially be needed or new policy endorsements obtained.

General housekeeping: A carrier will review the lease to determine whether there are any unusual administrative requirements that

may be difficult to comply with. Some lease administration departments cannot realistically calculate fair market value adjustments, send rent payments outside the first of the month, or send the rent check together with the utility reimbursement or other documentation.

Rights of First Refusal

These days, landlords are being inundated with rent stream buyout offers. As part of the buyout transaction, landlords typically transfer certain interests in the lease or over the premises to a third party. Depending on the nature of the rights acquired, the third party may be in a position to charge above-market rents to the carrier. Or, a carrier may find itself faced with a Wall Street investor landlord who has no interest in responding to zoning signoffs or requests for consent during the lease term. Right of first refusal provisions typically require a landlord to provide a carrier with notice of any seriously contemplated offer, which allows the carrier an opportunity to meet the terms and conditions of the third party's offer. Carriers that buy out the rental stream on their own sites ensure that the contractual line between the property owner and cell site tenant remain unbroken. Also, this may help avoid the situation in which a carrier leases the original premises footprint from the buyout company but also must enter into a second lease with the property owner for additional space for a generator, fiber-optic lines and other equipment. Why have two leases at one site?

Modification and Expansion Rights

It is almost certain that a carrier will contemplate expanding its equipment or antenna space, add utilities such as fiber or add equipment such as a generator during the lease term. In addressing equipment modification and site expansion rights, landlords may agree to lock in the rental rate for future expansion or agree that no rent increase will be due for site modifications needed to keep the technology at the site current or in compliance with law.

Assignments

Any restriction on the ability to freely assign the lease may cause legal issues or increase costs in the event of a merger and acquisition or sale of the asset. Where landlord consent is required, a carrier may seek to carve out transfers to the top national carriers and tower companies, corporate affiliates and assignees of the applicable Federal Communications Commission license.

Landlord Termination Rights

To the extent possible, carriers will seek to limit or remove landlord termination rights so that the carrier can be assured of continued long-term operability at the site. At the very least, carriers will seek to extend the termination notice period far enough in advance to allow the carrier sufficient time to get an alternate site on air. In jurisdictions where zoning is difficult, carriers may need 18 or 24 months.

Helpful Provisions

Although the following provisions may not be essential, they could be helpful in that they could one day be

put to use. They can be the subject of much negotiation between sophisticated landlords and carriers. However, when examining the totality of relevant considerations in deciding whether to accept or renew a lease, because these provisions may or may not be triggered, these provisions may be less essential than the must-have provisions previously mentioned.

Interference: Carriers often view lengthy interference protocols between the landlord or its tenants on the one hand, and the carrier on the other hand, as a strict necessity for wireless industry leases. However, in the event that the landlord will not agree to the standard interference language, the carriers may also consider whether the protections afforded under the interference resolution regulations and processes of the FCC provide additional protection.

Mutual and parallel indemnities: The ideal indemnity provides for mutual and parallel obligations between the parties. Where this ideal cannot be achieved, carriers will work with counsel to determine the best alternate course of action. If the landlord will not agree to a contractual indemnity obligation, perhaps the landlord will agree to remove the contractual indemnity altogether, which may leave the parties with indemnities provided as a matter of law. Or, the scope of a one-way tenant indemnity obligation may be sufficiently narrowed so that it only applies to the extent of the tenant's negligence without risk of exposure to damages caused by the landlord or third parties. At minimum, where a landlord fails to provide the tenant with a contractual indemnity, the carriers

will seek to ensure that they do not waive any claims against the landlord.

Sublease rights: Sublease rights are an area where a “no” from the landlord does not always mean “no” — even when consent rights and sublease rent are issues. Many times, a landlord will agree to allow a carrier to sublease space contingent only upon the subtenant obtaining its ground space from the landlord directly. This structure allows the landlord to know which subtenants are on the property and allows the landlord an opportunity to negotiate rent from the subtenant. The original tenant does not have to worry about obtaining landlord consent or negotiating and administering sublease rent splits.

Carrier right to terminate for convenience: Termination for convenience provisions can provide the basis for a carrier to terminate a lease in instances not covered by other enumerated termination rights. For example, a cell site may be technically compatible with the network but still on a carrier’s termination list. If a carrier has to wait until the lease expires to terminate the lease, this may increase network operation costs.

Landlord insurance requirements: Landlord insurance requirements are helpful to manage risks and are likely to be zealously pursued. However, on certain rare occasions, sophisticated landlords (such as hotels) may hesitate to agree to a landlord requirement for insurance in a lease, especially a cell site lease that is considered incidental to the landlord’s general operations at the property. When faced with this reluctance, a carrier may look at



other circumstances that might make the absence of this obligation acceptable. For example, a carrier may check mortgage or deed of trust documents to see whether the lender has required the landlord to maintain insurance. This may provide some level of comfort because lender insurance requirements often exceed those found in cell site leases.

Conclusion

The decision whether to accept the terms of a particular lease amendment or renewal is, ultimately, a business decision. The agreement needs to make good business sense based on a careful assessment of the totality of various factors that include actual costs (e.g., rent and other payments required under the lease), as well as the risks presented (both legal risks as well as business risks such as

loss of competitiveness and the cost of pursuing alternate solutions). The time spent in careful management of lease renewals will pay off for the carriers in the long run by keeping their operating expenses in check. The costs of outdated lease provisions, especially those stemming from an agreement inherited through the acquisition of another carrier with different leasing standards and protocols, could lead to rent claims, attorneys’ fees and litigation costs affecting the bottom line.

Lynn Whitcher is the associate general counsel of Md7 in San Diego. She also serves as secretary of the Women’s Wireless Leadership Forum and co-chair of the California Wireless Association Education Committee. Her email address is lwhitcher@md7.com.

Are Small Cells Overhyped? The Case for Macrocell Tech Densification

With the concept of the mini-macro, you use well-known radio technologies. What you are really doing is packaging it so that it's easier to implement.

By J. Sharpe Smith

Using multibeam outdoor antenna technology to serve commercial wireless communications users indoors may work as well as placing antennas indoors with an indoor distributed antenna system (DAS), picocell or small cell. Amid the hype for small cells, Phillip Sorrells, CommScope vice president of strategic marketing, stands out as someone who questions the rush to the new technology.

The problem that needs to be solved is providing wireless network capacity in places that are difficult to cover with the kind of data throughput and performance that consumers expect, Sorrells said. "Our answer often is DAS, especially inside buildings, venues and arenas," he said. "It provides multiple-operator, multiple-technology and dynamic high-capacity solutions."

There is a place for a picocell, remote radio head solution, such as the Ericsson Dot, for smaller buildings or even larger buildings that need a single-operator, single-frequency indoor system, according to Sorrells. But for other indoor coverage and capacity needs, Sorrells maintains

that an outside-in strategy is viable. By outside-in, he means splitting the 65-degree beam in a nearby cell tower. A twin-beam antenna results in two 33-degree beams, which doubles the capacity of that sector, increases the gain by 3 dB and improves building penetration.

Beam-splitting

"Take a college dormitory, for example," Sorrells said. "One approach is to take an antenna sector that faces the dormitory and do some beam-splitting techniques on that sector to enhance the capacity and efficiency of the coverage going into that dormitory from the outside in."

Multibeam antenna technology can also add capacity for an outdoor system. An existing tower can be densified by using beam-splitting antenna technology, which divides one beam into five beams. The technique provides a "tremendous uplift in radio capacity and a 6 dB gain in each beam," Sorrells said.

Contradicting small cells

Conventional wisdom says that the coverage of 60 small cells equals the

coverage of 10 macrocells, but Sorrells questions that logic. "Where are you going to get those sites?" he asked. "People answer that they will use telephone poles and streetlights. It is not that easy. I see several viable



A CommScope metrocell with beam-splitting can serve nearby in-building users. Photo courtesy of CommScope

MINI-MACROCELLS



A sequence of images shows the installation of a macrocell canister on a monopole that supports a billboard, disguising the cell site as an advertising structure. *Photos courtesy of CommScope*

MINI-MACROCELLS

/ FEATURES /



The Ericsson Dot is an example of a picocell, remote radio head solution for smaller buildings or even larger buildings that need a single-operator, single-frequency indoor system. Photo courtesy of Ericsson



A well-placed mini-macrocell could provide in-building wireless coverage for a college dormitory instead of using several small cells.

MINI-MACROCELLS

paths for wireless operators to explore for expanding wireless capacity.”

One answer to the need for densification is a concept Sorrells calls the mini-macro, whereby a remote radio unit, antenna and other RF path equipment are concealed in one monopole-type structure. In fact, three mini-macros will provide the coverage of six small cells.

“We are exploring different ways to interface the radios and the antennas to make the overall size small and easier to implement,” he said. “We think using fewer sites is almost always going to be preferred.”

A mini-macro would have a 20-watt radio, 10-watt radio or 5-watt radio, and it would look like a macrocell to the operator, with all the usual radio and handoff management parameters.

“All the radio parameter complexities of the picocell that cloud its introduction into the radio architecture are eliminated,” he said. “With the concept of the mini-macro, you use the same well-known radio technologies. What you are really doing is packaging

it so that it is easier to implement.”

The other theory Sorrells is advancing is that capacity can be improved by using a more sophisticated antenna than is available with a picocell.

Economics

“Downtilt and pattern management capabilities, we believe, allow you to build half the number of new small cell sites,” Sorrells said. “The question becomes one of economics. The math will prove that building three mini-macros, which are a little bigger,

will make more economic sense than six small cells.”

In the world of network optimization, downtilting an antenna’s beam is about 60 percent of the technique. “It is a very important tool for optimizing any network antenna,” Sorrells said. “When compared with a one-element, dipole, omnidirectional antenna, a quasi-omnidirectional antenna with three sectors and a 16-degree tilt offers a 36 percent improvement in network capacity.”



“The math will prove that building three mini-macros, which are a little bigger, will make more economic sense than six small cells.”

Phillip Sorrells
Vice President, Strategic Marketing
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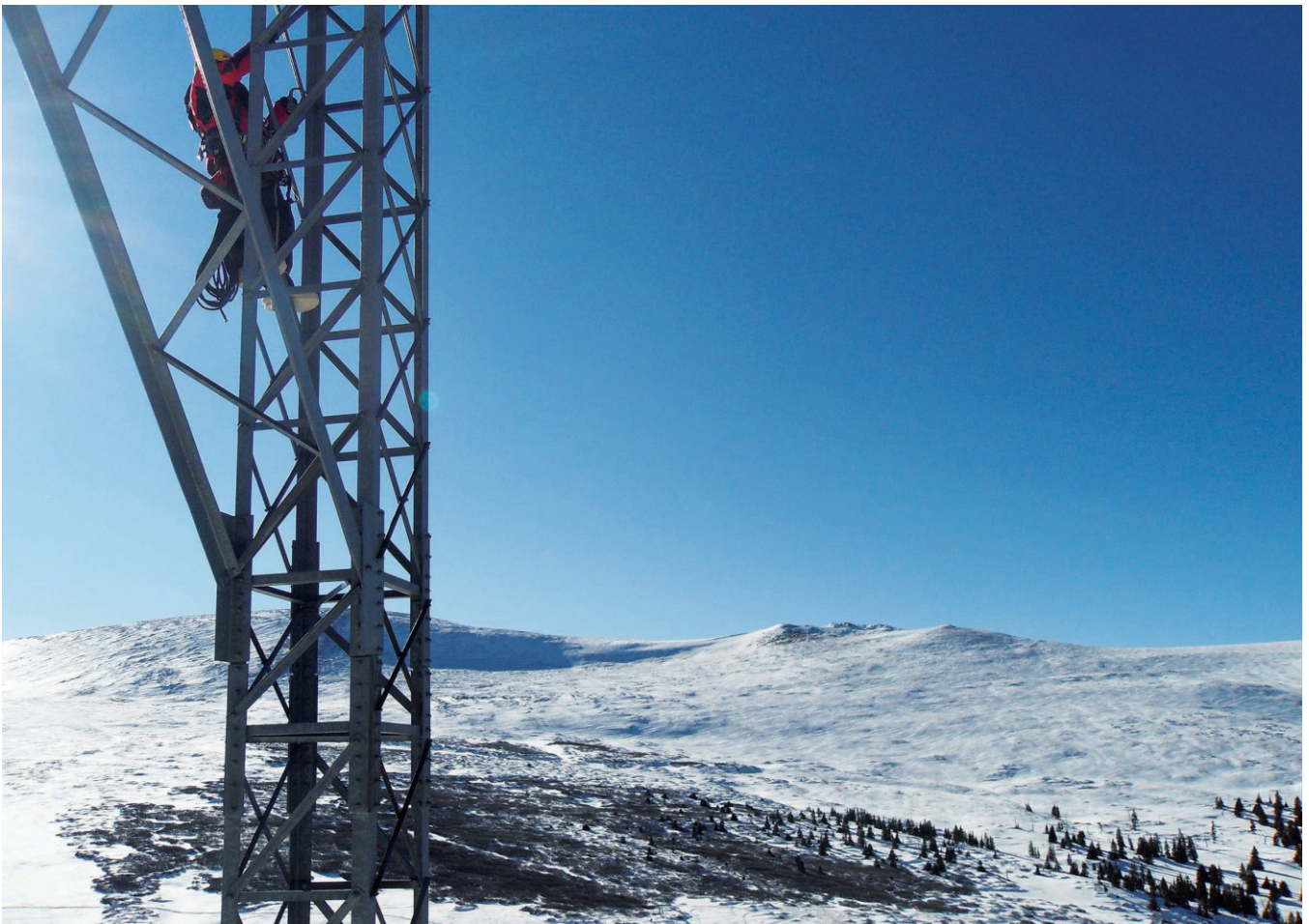


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SAFETY

New Research Helps Explain Why Climbers Fall

Fatigue, dehydration and hypothermia are among the reasons workers who climb towers may fall. Proper clothing and adequate rest and warming breaks help to prevent their effect on thinking ability.

By Bill Siuru, Ph.D., P.E.

Not surprisingly, the incidence of falls per climber hour increases as temperatures drop. Although hypothermia is a major reason, there are other contributing factors, such as improper

clothing. Recent research by hypothermia and cold weather survival expert Art Seely and two of his senior tower climbing and rescue instructors, Todd Horning and Brian Bourquin, have shed some new light on why

climbers are less productive and are more likely to fall in extremely cold weather. Seely is the founder and CEO of Safety One Training International in Littleton, Colorado. Horning and Bourquin are level-3 technicians

certified by the Society of Professional Rope Access Technicians.

Seely has proposed two possible reasons why cold weather leads to a higher incidence of falls based on information documented in peer-reviewed research conducted in Europe. The first reason is that the effects of hypothermia can occur at higher body temperatures than previously assumed. In the United States, it is commonly believed that the very first mental effect of hypothermia occurs only when body core temperature reaches 94° F. At this temperature, the body gives up on shivering as a method of combating heat loss and begins to shunt blood away from the extremities, starting with toes and fingers.

When the body switches from shivering to shunting blood away from extremities, it does so through vasoconstriction, defined as tightening the muscles in the walls of arteries and veins. This shrinks the size of the blood vessels, lowering blood flow. This change means the body has now slipped into second-stage hypothermia. Seely notes that people experience degradation in their ability to think during second-stage hypothermia, but there was never a conclusive answer as to specific symptoms that would occur. His own experience shows that victims either panic or they become horribly indecisive at a time when decisions are critical.

The new information from research in Europe shows this mental degradation can occur at body core temperatures as high as 97° F. The earliest signs are poor decision-making, specifically risk-taking. The two biggest predisposing reasons —



Research shows that a climber who is even mildly dehydrated, fatigued or both will fall victim to hypothermia much sooner.

not medical conditions, but variables under individual control — are exhaustion and dehydration. A climber who is even mildly dehydrated, fatigued or both will fall victim to hypothermia much sooner than another individual who isn't.

Climbing towers is exhausting work. The vast majority of climbers do not carry water in cold weather because they don't think they are exposing themselves to increased fluid loss because they are so cold they do not sweat. However, at extremely low temperatures, the body experiences the vast majority of its fluid loss through respiration, not perspiration. Air breathed in at 10° F is at 10 percent relative humidity, whereas air exhaled at 98° F body temperature is at 100 percent relative humidity. The

evaporation, that is, evaporative cooling, comes from the lining of the lungs.

The conclusion is that hypothermia prevention for climbers needs to include consideration of fatigue and dehydration. Managers can put in place some simple, commonsense solutions that would quickly mitigate these problems. All climbers should carry a quart of any beverage they like (excluding alcohol) on all climbs. They can use a simple Nalgene bottle attached to their harnesses or, for warm beverages, a lightweight metal thermos positioned not to impair access to other climbing gear. Safety One is working on a modified, insulated carrier for a lightweight flexible Camelbak system that could be attached to a climbing harness without impairing the climber's access to

/ FEATURES /

necessary gear and without impairing the functioning of safety devices. The manager should be familiar with each tower structure and specify in advance different points on each tower where climbers can stop to take a mandatory 10-minute break to consume a drink and to warm their cold hands and fingers on all climbs.

Often overlooked in evaluating how much fatigue a climb may cause is the length of the workday. A climber who has been on the job for six hours assembling equipment on the ground may already be too fatigued to climb when you include the stress of assembling heavy equipment outdoors in the cold. Managers also need to factor in the total time on the structure while the climber is stationary as another reason to schedule a warming break. Sometimes, all the climber needs to know is that his managers care more for his safety than they do about meeting paper deadlines. That can be enough for the climber to make better decisions and avoid accidents.

Second, Safety One International has researched the cooling of climbers' hands, specifically the loss of point sensory perception. This is the loss of feeling and muscle strength when hands are in prolonged contact with highly conductive metal tower surfaces at temperatures below 60° F. Metal is 17 times more conductive than air. Gloves are of only limited effectiveness.

Hands vasoconstrict in response to cold against the nerves in the skin of the hands and the possible combination factor of hypothermia. Decreased circulation leads to an immediate and measurable loss of muscle strength in the hands. More importantly it reduces point per-

ception, a reflection of how well the climber can feel objects in the hands. Point perception is a measurement of how far apart on someone's fingers two sharp points have to be before the individual recognizes that there are two different points. When the hand is cold, the point perception can be as much as a half inch. When the hand is warm, the same individual can sense two distinct points at as little as one-eighth inch apart.

Climbers use a variety of attachment devices with complex locking mechanisms that must be constantly detached and reattached. This becomes difficult, if not impossible, to do with the onset of reduced point perception that occurs with prolonged contact with cold, metal structures. For example, there was a case in which a climber clipped a positioning strap onto the wrench in his waist belt rather than the D ring. Fortunately, he lived to tell about it. This is an example

of a situation where some scheduled rest and warming breaks could have prevented the hands from becoming so numb that the climber could not sense the improper attachment.

Finally, in discussions with managers of some of the largest companies in the tower business, Seely found that they bought and issued PVC two-part rain suits to keep wind off of their workers. Unfortunately, when climbers went up a tall tower in the cold, the PVC froze and the rain suits were shredded by high wind and blew away. The managers often did not realize it was illogical to put a worker in a rain suit that does not breath and have the worker climb and sweat all the way to the top of a 300-foot tower. These managers were unaware about the need for proper clothing layers when working in cold weather.

There are plenty of well-designed garments of different types that provide breathable protection

SAFETY

Research into the Causes of Falls

Art Seely, the founder and CEO of Safety One Training International, is looking for case histories to aid in research into the causes of falls. The company will publish the results, including supporting peer-reviewed medical studies, at the conclusion of the project, which has been named the DEF Project. DEF stands for dehydration, environment and fatigue. Controlling these factors is seen as important for reducing serious falls. It is hoped that the

study will assist in establishing a new awareness of the causes of falls and will lead to establishing new, safe work practices. If you have experiences related to falls as a result of any of these factors, please contact Seely at Safety One Training International, 8181 W. Brandon Drive, Littleton, CO 80125; 303.734.0772; or arthur.seely@safetyoneinc.com. For more information, visit www.safetyoneinc.com.

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Art Seely, founder and CEO of Safety One Training International, is operating the company's envirochamber where tower-climbing students can test various types of insulating and outer protective layer garments at temperatures of -10° F and wind speeds up to 50 miles per hour.

SAFETY

against cold and wind. Safety One maintains an envirochamber where tower climbing students can test various types of insulating and outer protective layer garments at temperatures of -10° F and wind speeds up to 50 miles per hour.

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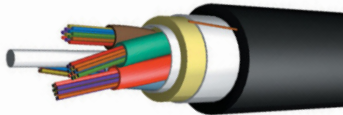
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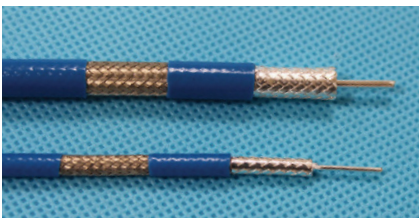
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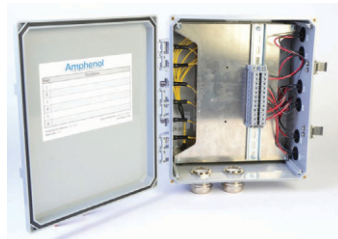


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/ DEPARTMENTS /

Advertiser Index

16.....Aero Solutions
 28.....AGL Conferences
 50.....Allstate Tower
 24.....BB&T - Atlantic Risk Management
 17.....Black & Veatch
 25.....Canine Companions
 45.....Clearfield
 46.....Dynamic Environmental Associates
 48.....Federal Emergency Management Agency

09.....FieldSense
 C3*.....GME Supply
 47.....Hughey & Phillips
 43.....Humane Society
 49.....IAVA
 13.....Media Venture Partners
 C2*.....National Association of Tower Erectors
 41.....Radio Frequency Systems
 05.....Sabre Industries

C4*.....SBA Communications
 50.....Slatercom-WCD
 07.....Times Microwave Systems
 37.....TowerXchange
 15.....Waterford Consultants
 50.....White Buffalo Environmental

*C2, C3 & C4 indicate cover pages

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