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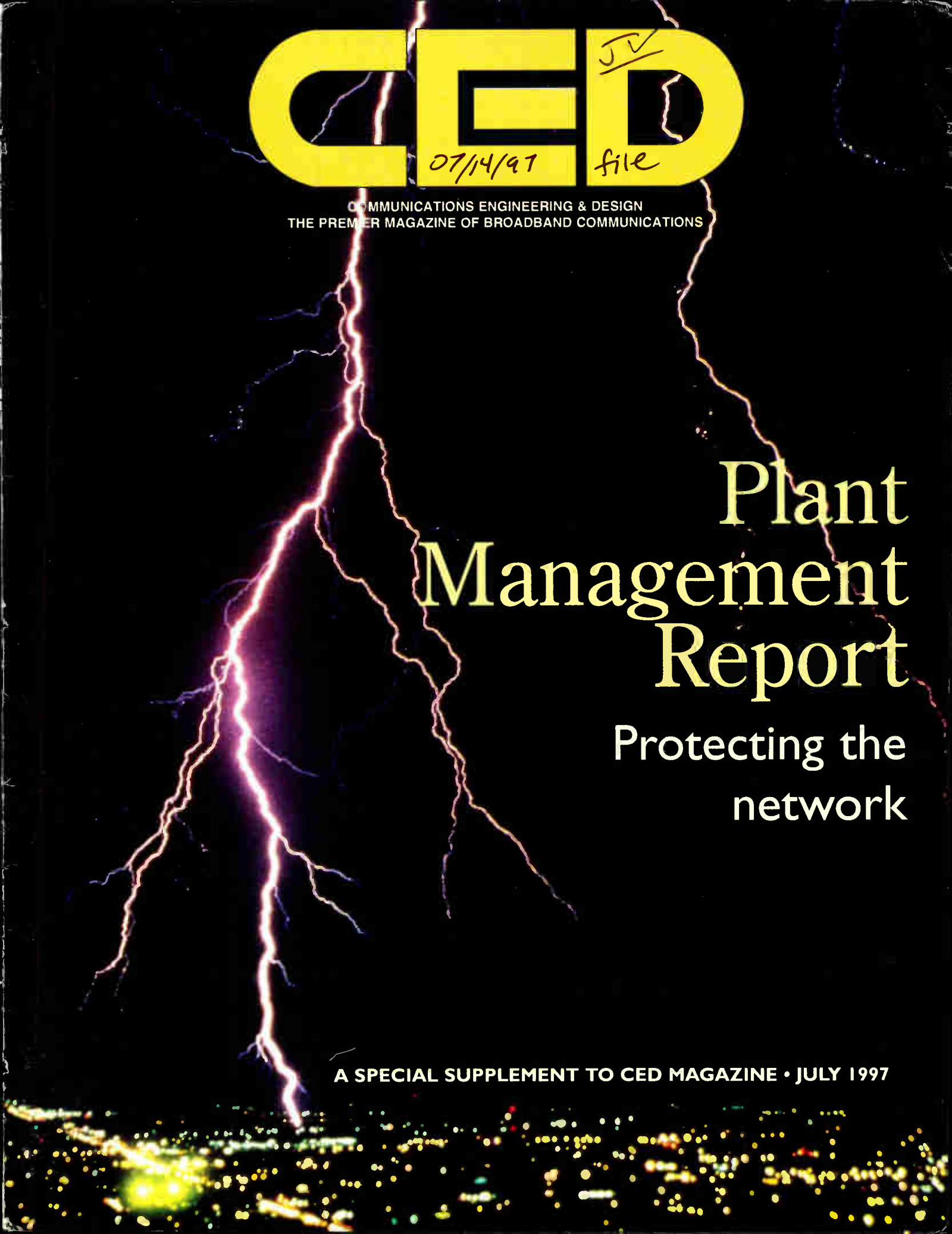

Plant Management Report

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A SPECIAL SUPPLEMENT TO CED MAGAZINE • JULY 1997

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Knock, knock! Who's there?

ROGER BROWN
EDITOR

It's not everywhere yet, but competition from the telephone companies is beginning to have an effect on incumbent cable operators. Look no further than what's happening in Detroit, Chicago, Cleveland and Columbus, and you can get a glimpse of the future.

Over the past year, Ameritech has received franchises from 37 Midwest communities, representing more than 750,000 homes passed. The RBOC has already brought its 80-channel "americast" service to 22 cities and towns and is enjoying a penetration rate of nearly 30 percent. Furthermore, 80 percent of Ameritech's customers are opting to take an advanced set-top, which has led to higher-than-average take rates for pay-per-view and premium channels. Ameritech customers are generating monthly revenues that are greater than the $34 industry average.

To compete with the incumbents, Ameritech used the very same hybrid fiber/coax technology the cable industry designed a few years ago. It has no inherent technical advantage over anyone else. But Ameritech came in with more channels, some compelling packages of programming and a super-charged customer service effort.

Competing cable operators have reacted predictably: They've lowered prices, postponed rate increases and bumped up the number of channels they offer. In short, the competition has fostered a new price/value ratio and helped keep a lid on rising rates.

But that's the easy stuff. The next step the cable operators need to make is to shore up customer service, become more efficient, improve maintenance response times and improve system reliability.

Help desks should be staffed around the clock

It's time to empower the front-line employees and provide them with some basic sales tools. Installers should be able to recognize an opportunity to sell upgraded or additional services, seize that opportunity, and get credit for the upgrade.

Help desks should be staffed with customer service reps around the clock. Subscribers with questions or problems should be able to get answers when they want them.

Networks need to be upgraded. Counter-rotating ring architectures and fully redundant systems are ideal, but they're expensive. Nevertheless, how many of you are still taking the network down for maintenance without informing your subscribers? These days, intentional outages should never come as a surprise.

These are just some of the more pressing operational issues enlightened cable operators should be wrestling with. They're also the types of articles we're striving to bring you with our series of *Plant Management Reports*. We hope you enjoy what you read here–and put the words to good use as competition comes knocking on your door.

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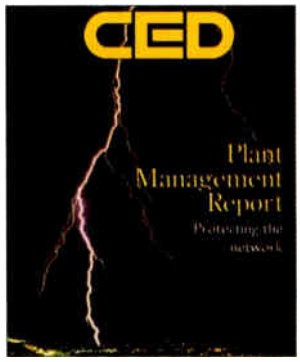
COVER



It's summertime, and challenges to system reliability are everywhere, from crackling lightning storms to blazing heat. Find out how to summer-proof your plant. Cover photo courtesy of The Weather Channel.

DEPARTMENTS

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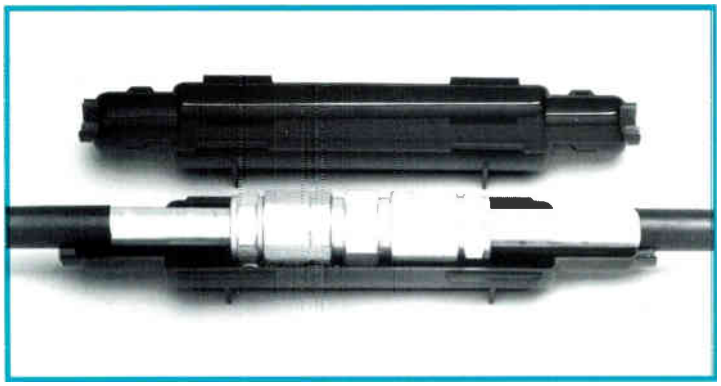

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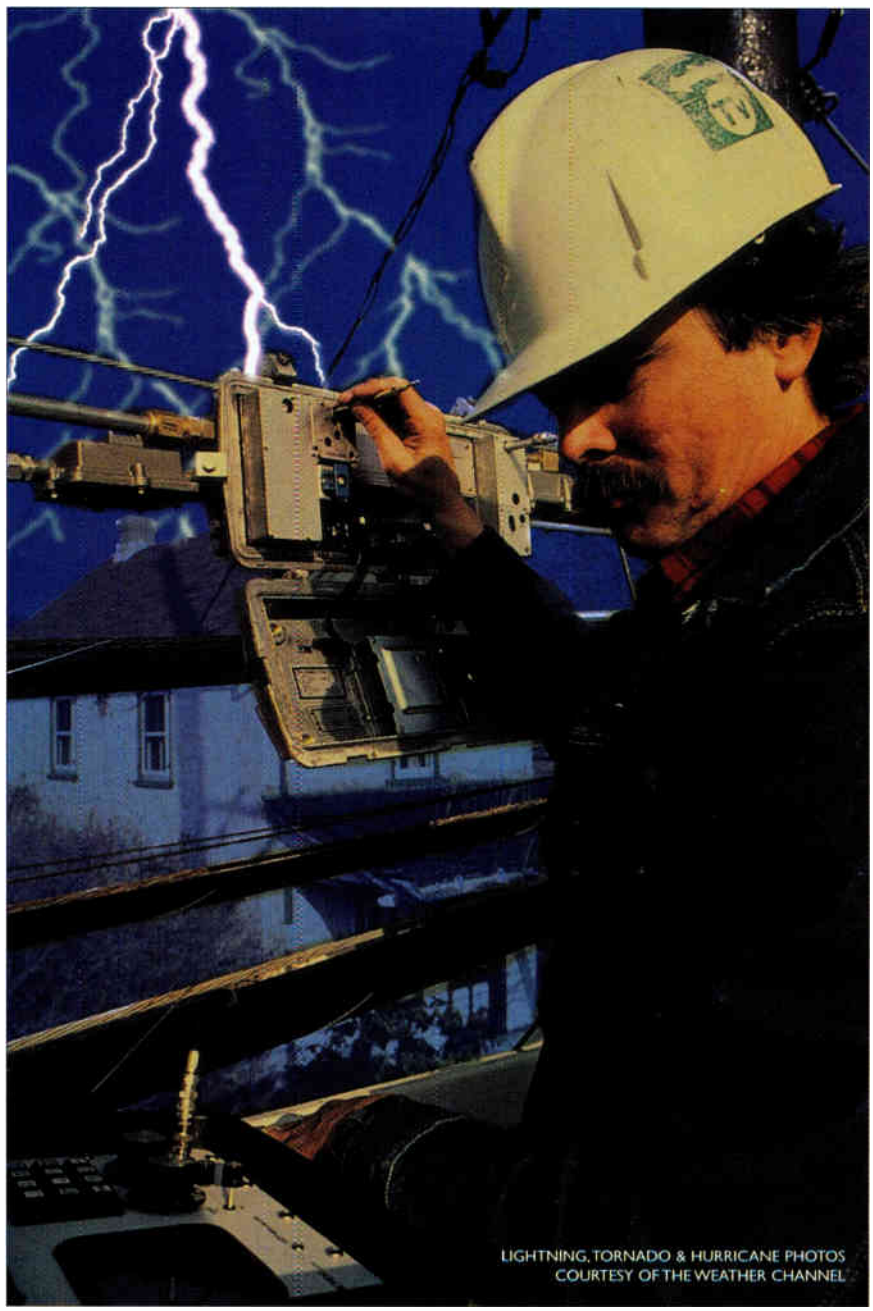
Keeping nature at bay during the summer

When it comes to reliability, summer storm activity can take its toll

By Michael Lafferty

After Spring has sprung and the summer heat has begun to dry out the surrounding landscape, many operators go into high gear trying to catch up on projects and plans that were put to the side over the past several months. While these same operators rush to take advantage of the often limited time they've got for this work, they also realize summer weather can wreak havoc not only on their personnel (see p. 12), but on their system's overall performance and reliability as well.

Be it thunderstorms, lightning, tornadoes, hurricanes, floods or even earthquakes, nature rarely takes a vacation in June, July or August. With system reliability becoming even more crucial as new services are rolled out on an almost daily basis, there's a lot operators can do to anticipate and mitigate the effects of these potential disasters.



LIGHTNING, TORNADO & HURRICANE PHOTOS COURTESY OF THE WEATHER CHANNEL

Summer construction woes

For many operators, summertime is the time to play catch-up. For those who have outside plant projects in the hopper, the winter and spring months mean hunkering down and waiting for fair weather. Once the sun starts to shine, construction and upgrade fever strikes big time. But, all that activity can have a downside as well. Keeping track of all those crews and making sure they don't inadvertently take the system down can be a real problem.

"A fairly straightforward issue in the summer," says Tom Osterman, president, Comm/Net Systems Inc., "is the fact that when you have nicer weather, the construction activity increases, especially in states that have fairly severe winters. So, you have this flurry of construction activity in the plant which can cause outages, either intended or unintended. The issue, in terms of reliability, would be for those involved in the construction planning side of things to make arrangements for bypass power capabilities, or temporary backup of different powering locations.

"There are various levels of sophistication with that, ranging from no backup at all, where they just try to

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Dealing with disaster

While living in the summertime is often considered easy, it can be a real disaster for cable professionals when the weather, or the world in general, turns nasty. A comprehensive disaster plan is an absolute must. Here are some considerations in drawing up a worthwhile plan.

• Store an adequate supply of backup equipment. Essentials include replacement cables & drops, flashlights & portable flood lights, power supplies/generators, chainsaws, diesel fuel for trucks, earth station antennas, backup phone systems, two-way radios, and security equipment/devices.
• Make arrangements

Continued on page 10

Marcotte

minimize the outage, possibly by trying to do it in the middle of the night when they're cutting over from one plant or power supply to another. Some of them will have portable generators or portable power nodes that will provide input power to an existing power supply if they happen to be disrupting the actual electrical utility input section for whatever reason."

Construction activity can also divert attention from reliability/powering maintenance activities that are particularly important during the summer, when storm activity heightens. "It's no surprise," says Eric Wentz, marketing communications manager for Alpha Technologies Inc., "that summertime is when many operators focus on and increase their maintenance activities. But sometimes, it becomes a matter of priorities. Other construction activities, like upgrades and rebuilds, take precedence and powering maintenance sometimes gets sidetracked."

Stand-by power supply maintenance is particularly important during the summer when thunder and lightning storms rumble across the country. Rick Marcotte, manager of sales and marketing for the Emerging Technologies Group at Exide Electronics, believes normal maintenance procedures are especially important during the summer months.

"In the summer," says Marcotte, "it's even more important as a result of the heat. Batteries, for example, are obviously a very heat-oriented phenomenon. Battery manufacturers typically rate their battery performance and longevity based on ideal climatic conditions. Typically it's 77° F or 20° to 22° C. So, if you keep your battery at that temperature, it lasts a good, long time. But, for each 10 degrees or so that it goes up in Fahrenheit, you can decrease battery life by a factor of two. That means you could cut a battery's life in half. Obviously, heat is really the enemy of batteries."

While it may be a pain, Marcotte says that for it to be a really effective maintenance check, batteries should be load tested as well. That means running them and finding out what kind of carrying capacity they have. Load testing is important, he says, "because weak batteries obviously reduce your standby time. And weak batteries increase your recharge time as well."

Marcotte says good stand-by maintenance also includes checking the battery connections, making sure they are clean and tight. "The other thing that's important," he says, "is to clean the vents on the exterior cabinets and the power supply. Because what happens over time is that insects, dust, dirt, you name it, gets involved there. You really need adequate air flow to make the power supplies last longer. And particularly in the summer, if the vents are clogged, that will shorten the life of the equipment. Cleaning the vents is not a real sexy thing to do, but it's something you've really got to do on schedule and on time."

He also recommends rotating the batteries on a regular basis. "If you have a three-battery cabinet," he explains, "the middle battery is the one that absorbs the heat more from each side, and it deteriorates quicker than the outside batteries, which are closer to the external environment. A lot of times, technicians or whoever is doing the maintenance will mark the battery that was in the middle, and then they move it. That way they can track the rotation of the batteries for a long period of time."

How often should stand-by batteries be checked? Gary Batson, principal engineer for Antec Network Powering, believes less is definitely not better. "Through the summer," says Batson, "they should be checked at least twice. At the beginning of summer would be a really good time to perform a load test on the batteries to ensure, in the event of an outage, they are capable of supplying standby power for a required period of time."

When it comes to powering and reliability, Batson says there also seems to be a resurgence of interest in dealing with bonding practices or poor bonding. "In some of the older systems," he explains, "maybe some of the bonds have developed resistances and need better maintenance. One of the best things operators can spend money on in preparing for the summer would be to investigate their bonding system. They need to verify that the bonds are still in place, that the contractors have installed the bonds properly, and that they are still functional. We've had feedback from some customers, where in some rebuild situations bonds have not been effectively installed. So operators really need to double check that."

Batson reports that he and his associates are seeing measurements of larger sheath currents out in the field as well. "The emphasis on bonding to the power neutral to effectively reduce the sheath currents and to shunt transients underground is very, very important," he says, "especially in high lightning seasons, and also in particular geographic areas where it's difficult to get grounds.

"In the course of checking the system for bonds and ground, operators should also measure sheath currents. I'm really not sure if any of the companies have set up a routine maintenance schedule for measuring sheath currents. Sheath current is something that usually develops or worsens because one of the utility neutral connections develops a higher resistance. And it may be something that has no effect on the utility company, and they don't routinely go out and check those issues. But, if we keep monitoring that, we can be proactive about preventing outages because of sheath currents."

As systems become more diverse in the services they offer, powering systems are becoming more complicated, with new designs and technology being deployed almost daily. This in turn, says Osterman, should alert operators to new maintenance concerns. "I guess another new issue," he reports, "would be that

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Reader Service 304

"Disaster," continued

to protect vital equipment with storage space at the headend and front office for essentials. Bolt down equipment where possible; tie down loose cables; cover phones & computers with plastic (bags) if flooding is expected.
• Coordinate strategy with key vendors and nearby operators. Maintain an emergency contact list of key vendors and nearby operators with office, cellular and home phone numbers.
• Coordinate strategy with local utilities and local governments.
• Have an Emergency Broadcast System in place to break into programming with on-screen crawls or other means to relay disaster news, warnings and relief information/contacts. Let civil defense authorities know how to take advantage of it.
• Establish mechanisms to keep the public informed. Be ready to run newspa-

Continued on page 12

over the last two years or so, several operators have deployed larger stand-by power supply systems called power nodes, and many of them involve an internal engine generator to provide long-term backup if there is a commercial power outage.

"So, one thing that is new in terms of maintenance, which most systems haven't dealt with before or haven't thought about, is generator maintenance. Does it need an oil change? How many hours has the generator operated? There are fuel system checks as well. Is it operating correctly? It may need to be load tested. Is there appropriate air flow for cooling of the generator system? Currently, this involves probably about 10 percent of the cable industry that would have this type of setup, and they need to be thinking about this kind of maintenance."

Osterman says that while maintenance goes a long way toward preventing outages, operators also have to be prepared for emergencies. "Preparation for emergency restoration is always a concern," he says. "I've been in a lot of field situations where I've gone out to install equipment we've designed, or I'm doing some consulting work, and invariably these guys are always busy, but they're not often that well organized. They just don't have the equipment they need to quickly get out where they need to be in an emergency.

"So, I'd recommend operators take the time to verify their spare parts capabilities. They really need to take the time to see if they have spares where they need them in an emergency. They have to decide where to put them, whether it's on the service vehicles, at the headend or at the warehouse."

Obviously, maintaining system reliability takes added effort, and sometimes money, during the hot summer months. But one of the most important factors in keeping services on line is time. Wentz notes that while a well thought-out maintenance plan and emergency disaster plan may take time up front, they will save a lot more time and money when lightning strikes (inevitably) again and again.

"These things take time," points out Wentz. "Maintenance programs are a year-round effort. Your maintenance program for summer, if you think about it, really begins in the winter. That means some summer maintenance has to be done long before summer temperatures start to climb. You've got to plan ahead and spread it out. Planning is the key, and sticking to that plan is what makes maintenance and emergency planning stick. It's a priority for any operator of any size." **PMR**

PW&C's lightning retardant cable

New hits in reliability?

Technology, it seems, changes as fast as the weather. It's important to stay on top of the latest technological developments. Here are a few new ideas that may just strike it rich.

Lightning retardant cable

Protective Wire & Cable Inc. unveiled its newly-patented lightning retardant cable (LRC) during Cable-Tec Expo in Orlando. Currently available in prepackaged kits for DBS satellite systems in varying lengths, the innovative drop cable will soon be available on reels for cable industry applications.

Inventor Samuel Gasque says the cable works by turning the magnetic field of a lightning strike against itself, thereby impeding the flow of current as the strike travels down the cable. As such, it forces the main energy surge down the ground wire to ground instead of down the cable.

Gasque claims independent laboratory testing has shown the LRC offers up to 700 percent improvement over standard RG-6. He says the Warranty Corporation of America will offer insurance coverage on any consumer home electronics (TVs, VCRs, stereos, etc.) that are connected to LRC lines produced by the company. (Tel: 800-263-3322)

One-stop surge suppression

Erico Inc. has introduced its single-unit, complete home surge suppression system, the Erico Protection Device Complete Home Protector (EDPCHP). The EDPCHP attaches at the primary service entrance panel or load center, and eliminates the need for primary surge protectors at each electrical outlet, phone jack and cable connector.

The EPDCHP is designed for 120/240 VAC single-phase power systems providing total peak surge current suppression capacity of 80,000 amps. The unit has a low let-through voltage of less than 500 volts. The unit eliminates ground voltage differentials between the protected systems by providing a single ground for power, telephone and cable. (Tel: 216-248-0100)

A UPS alternative

High Tech CATV, a subsidiary of Zilberberg Corp. in Tel-Aviv, Israel, has announced the availability of its Double Power Source (DPS) back up system for cable TV systems. Used in various Israeli cable systems for the last three years, the patented device enhances or replaces UPS modules in cable systems.

The DPS essentially senses power drops below 48 VAC and immediately redirects power (by internal switching inside the unit) from an unaffected area.

Typically, the DPS is located within the trunk amp, and can be configured to connect to most types of trunk amps including push-pull, power doubled and feedforward. For fiber networks, an external DPS is located outside the receiver. The manufacturer claims the use of DPS units requires minimal changes in existing networks. (Tel: 972-3-6993396) –ML

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"Disaster," continued

per ads, radio/TV spots and cross channel updates about service restoration and other information. Designate specific people to act as spokespersons for your company.
• Prepare your employees. Write down, publish, distribute, discuss and review disaster plans with employees on a regular basis. Train them in first-aid techniques, especially CPR.
• Designate specific employees as disaster coordinators and detail their responsibilities. Create emergency contact lists (office, cellular and home phone numbers) for these employees. These personnel should have multiple copies of disaster plan/contact lists for safekeeping and easy access (in office, car, home, etc.) during an emergency.
• Review and update insurance coverage on a regular basis.

Hot times in the summer...

Come summertime, the heat can take its toll on man and machine alike. Installers and technicians working in the roiling heat should be on the alert for heatstroke/sunstroke and heat exhaustion. Here are the telltale signs and treatment for both, as well as some common sense prevention advice for cable workers in the sun. (Hint: copy and distribute to workers or post in company vehicles.)

Heatstroke/sunstroke symptoms:

- Red, dry, very hot skin (sweating has stopped)
- Headache, nausea, dizziness
- Pulse - strong and rapid
- Dilated pupils
- Very high fever
- Disorientation, confusion
- Unconsciousness, convulsions

Heatstroke/sunstroke treatment:

- Heatstroke/sunstroke is life threatening! Seek medical attention immediately.
- Lower body temperature immediately. Move to cooler location or shaded area, place feet higher than head.
- Loosen or remove clothing; fan victim.
- If possible, immerse in cool water or use cold compresses to head and neck areas, also to armpits and groin.
- DO NOT use alcohol rubs, give fluids or use medications to lower fever.

Heat exhaustion symptoms:

- Pale, cool, clammy skin
- Sweating
- Headache, nausea, dizziness
- Pulse - weak and rapid
- Dry mouth
- Muscle cramps
- Fatigue, weakness

Heat exhaustion treatment:

- Move to cool place indoors or in the shade
- Lie down in cool, breezy place or fan victim
- Loosen clothing
- Drink fluids - cool or cold water; drink salted water (1/2-tsp salt/qt. of water)
- Eat salty foods such as saltine crackers (if they can be tolerated)

Prevention:

- Wear light, loose-fitting clothing. To promote the evaporation of sweat, cotton or natural fibers are recommended over synthetics such as polyester.
- Drink lots of fluids, particularly if urine is dark yellow. Slightly salted water is recommended (1/2-tsp salt/qt. of water).
- Do not drink alcohol or fluids with caffeine because they speed up fluid loss.

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Reader Service 307

How to insure a

Crafting smart and creative insurance plans

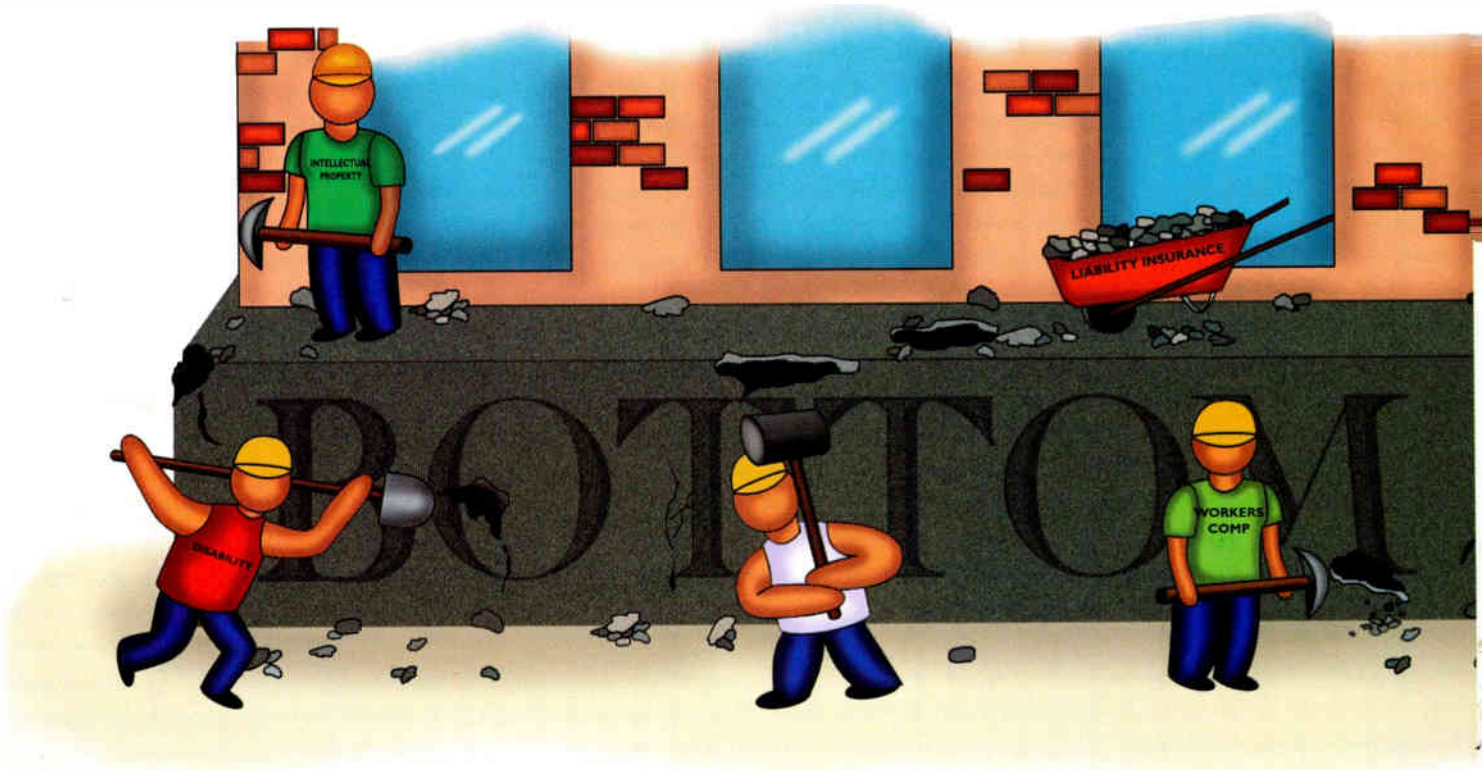
By Craig Kuhl

Business, in particular cable TV, has become accustomed to constant change and the growing belief system that when you incorporate change, something should happen. It may be good, bad or indifferent, but SOMETHING kinetic occurs. And usually, that something affects the bottom line.

However, there's one element in the cable industry, and business in general, that is contrary to that belief and will save a company significant dollars when *nothing happens*.

Smart, creative insurance plans are fast-becoming a mandate for cable operators and a growing number of telecommunications companies that are seeing insurance claims spread beyond the traditional property damage and accident/injury losses to include intellectual property loss, office-related injuries and more. These policies are becoming valuable, even critical, weapons in a company's fight to retain its bottom-line revenues.

In 1995, more than $19 billion was spent on medical costs for work-related injuries by employers nationwide,



healthier bottom line

and $43 billion was paid out under workers compensation. And, just 52 percent of the total workers compensation benefits paid were covered by private insurance companies. That leaves 48 percent to be paid by other sources, including employers and workers. And those costs, left unchecked, can chew up a company's profits.

The cable industry is well aware of the complex and tedious relationship it has with insurance companies. With its inherent risks of property damage through natural disasters, work-related injuries in the field and other risks, cable is considered by most insurers as a moderate to high risk industry. This fact pushes some cable operators, mostly larger ones, into hiring risk management experts, and forces smaller operators to scramble in a catch-as-catch-can search for adequate insurance coverage.

"The biggest insurance challenge today for cable is finding coverage for transmission and distribution lines (cable plant, or T&D) and overhead cable lines," said Bob Guevara, assistant vice president for Inland Marine Insurance Association. "What's caused concern is greater consolidation among telephone companies and cable and the catastrophic potential of natural disasters. Insurance companies are afraid of cable wires being strung out all over, especially in the coastal regions," he added.

Most cable operators and insurance companies realize this is part of the price of doing business, especially in high-risk areas. Says Guevara, "There's not much an operator can do if a utility pole goes down. That's the price of doing business in those areas." However, some operators, Guevara concedes, are now becoming self-insured or using self-insured retentions–very high deductibles–which Guevara admits are "becoming almost cost-prohibitive, especially for the little guys, who are really being squeezed."

Some operators whose businesses carry a higher risk are even looking into specialty carriers. "Some of the larger operators might be pushed to off-shore carriers. They give the insurance company a certain amount, say $5 million, and if nothing happens, the operator gets $4 million back. These are legitimate carriers and may be the only way to go for some operators," said Guevara.

Choosing which insurance path to take is risky business in itself, and juggling insurance companies, costs and the ever-changing characteristics of coverage is tricky for the majority of those companies who must use insurance carriers. And for those who don't, their sheer size warrants an insurance company-sized approach. "Some of us (top 10 cable operators) are so big we almost operate as an insurance company. We're probably in the top 10 percent of insurance companies," said Greg Martin, director of claims for TCI. Smaller companies outside the top 10, Martin says, are almost always with insurance companies and not self-insured.

According to Martin, 50 percent of TCI's loss frequency and loss dollars are from workers comp. The remaining 50 percent is split between auto liability and general liability.

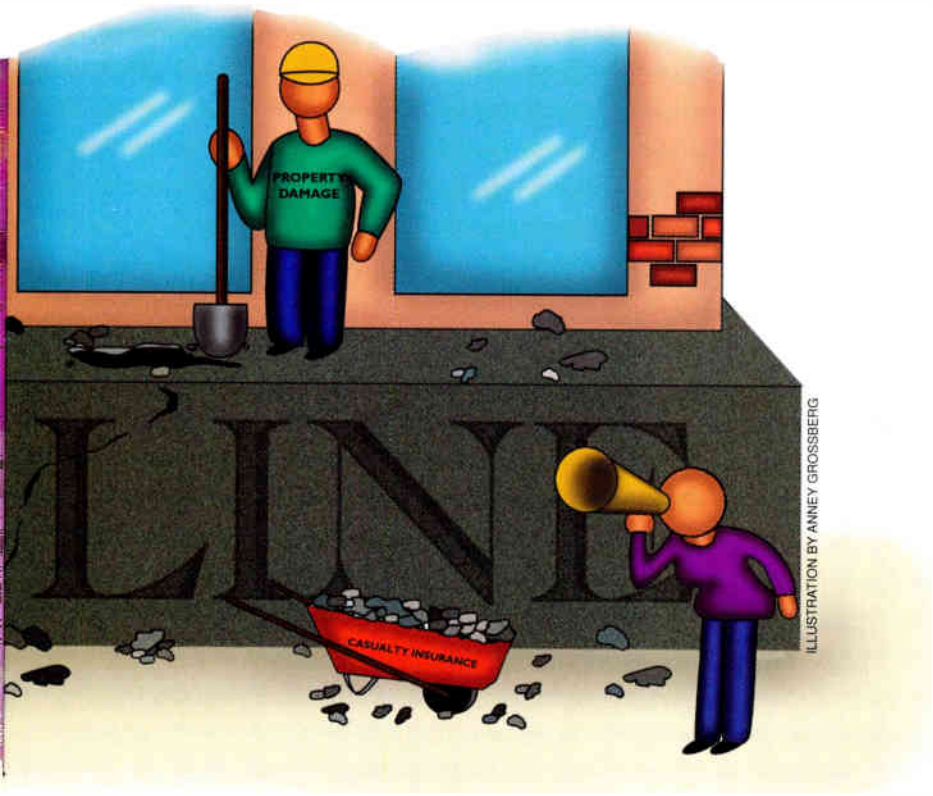


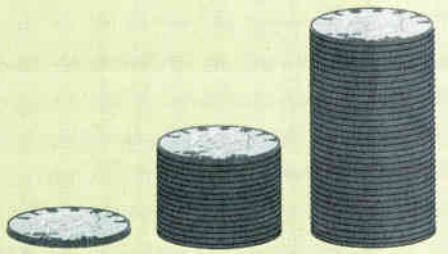
ILLUSTRATION BY ANNEY GROSSBERG

Only the phantom knows

Because of TCI's size, it uses a large stable of sub-contractors, which, according to Martin, carries a growing, and serious, insurance issue with it. "In the past, if you hired a sub-contractor for a rebuild and he subs out part of the job, you move down the (insurance) food chain. Once you do that, you have to have reputable contractors with adequate insurance."

To avoid insurance-less contractors, and ones who will cut corners by using phantom insurance companies, or what Martin calls "Shifting Sands Mutual," TCI publishes guidelines on what a contractor must have for insurance and uses the *A.M. Best rating guide* to help it determine the quality of insurance carried by its sub-contractors. The guide rates all licensed insurers and is similar to Standard &

Figure 1: *Cost of work-related accidents.*



$1.4 billion in work-related vehicle damage

$19.2 billion in work-related injuries

$43 billion paid through workers compensation

Figure 2: *Percentage of total workers comp benefits paid annually (1993).*

Figure 3: *Amount of each dollar used for work-related injuries, workers comp and all related claims.*

$0.53 from corporate dividends to stockholders

or

$0.20 of every dollar of pre-tax corporate profits

* 1993 figures

Source: National Safety Council

'The biggest insurance challenge is finding coverage for transmission and distribution lines'

Poor's company rating system. Added Martin, "We try to make sure our sub-contractors—from ad agencies to construction companies—have adequate insurance."

Having adequate insurance, identifying the risks in the workplace, and "engineering out risks" are keys to a compatible working relationship with sub-contractors, according to Rich Holston, manager of environmental safety and litigation for Mobile Tool International, a supplier of manual lifts and cherry pickers to the cable industry. "By working closely with our customers–in this case cable operators–we can determine what is acceptable for the design and manufacturing of a product. It's important to be part of the process," Holston said.

His company has steadily reduced accidents for its cable customers during the past 10 years by:

•auditing the field use of the product and working closely with the customer and manufacturer;

•educating the customer and manufacturer about the product; and

•participating in SCTE issues.

Added Holston, "Once our customers and employees become part of the solution and are made aware of the risks, the results will be fewer injuries and lower insurance costs. The insurance industry rates the cost of workers comp by a simple formula–the lower number of injuries, the lower your insurance costs."

As simple as that may seem, getting one's arms around the infinite number of insurance issues–from workers comp to intellectual property coverage–is a daunting challenge, and one needing constant attention. If there is one defining moment which got the industry's attention, it was Hurricane Andrew, which changed many of the traditional rules for cable insurance. "After Andrew, the re-insurance market totally dried up for transmission and distribution. We had to change our whole approach, and rates became significantly higher. It just became very difficult to get T&D insurance because of the huge losses," said Margy McKenna, director of risk and benefits for Jones Intercable.

Since Andrew, T&D insurance costs recently have

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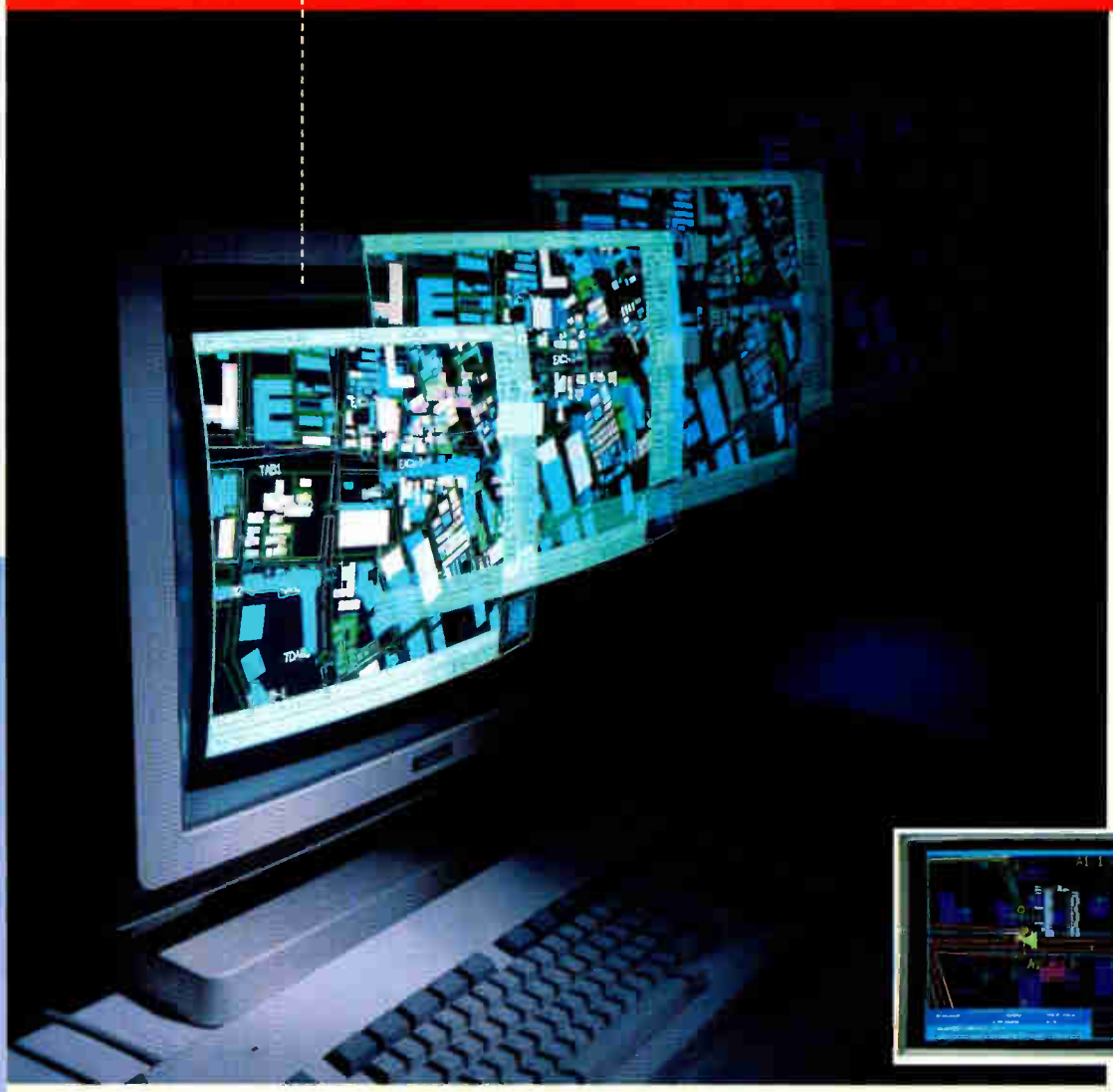

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come down "just a tick" McKenna says, but remain high because "there have been just so many natural disasters since," she added.

Insuring a cable system, large or small, often comes down to not only how you do business, but where, as most cable operators with systems in high-risk areas (coastal zones for instance) will attest to. Time Warner has 50 divisions nationwide, with some in high-risk areas vulnerable to hurricanes, tornados and even the infamous New York City drivers. "We have systems in higher risk sections of the country, and certain higher risks related to job functions like repairing downed wires after a hurricane and driving in New York City, which is a tough area for our drivers. It's a real challenge, and we have had our share of accidents and workers comp claims there," said Steve Reisner, risk manager for Time Warner Cable.

Reisner and Time Warner are very cognizant of the high costs associated with increased insurance claims to the company and its bottom line, if claims are not controlled. "We've had an overall cost saving in the past two years because of our reduction in claims," explained Reisner. A primary reason, he says, is because "More of our divisions are hiring safety professionals. We need someone to coordinate our safety procedures, and it's been cost-effective."

How to cut costs

The company, according to Reisner, focused on three key areas: Adhering to its policy and procedures manuals; distributing the company's newsletter to key individuals in the organization focusing on claims, management and loss control; and keeping employees informed while addressing problem areas first. Instead of offering up a laundry list of achievable goals, the company prefers to concentrate on two or three priority areas.

That approach, says Dan Chilton, national service director, loss protection for Liberty Mutual Group, is a good one. "What's causing injuries, or the 'loss source,' and what controls are in place to prevent injuries and claims are very important. Under workers comp, 70 percent of each premium dollar is due to direct losses, so a healthy, dynamic and practiced safe-

Keeping disasters under control

Natural disasters, particularly Hurricanes Andrew and Bertha, along with a series of tornados, earthquakes and other disasters, have changed the way the insurance business looks upon cable.

Most cable operators continue their quest for adequate insurance coverage, while keeping their costs in line. Here are some key areas to focus on, as suggested by insurance experts:

1) Maintain accurate and timely claims records

2) Keep employees well-informed on the risks inherent in their jobs

3) Monitor the company's safety and training programs carefully and make sure the procedures are being followed.

4) Determine the "loss source" or what's causing recurring accidents and know what controls are in place to prevent injuries and claims.

ty program is crucial because losses can sneak up on you."

According to Chilton, once a company's culture allows these losses to continue, it's difficult to shake the stigma attached to them. For example, a growing number of insurance companies are using a concept called the Experience Modifier Rate (EMR), which rates each company and its workers comp claims history as a way to set premiums. It's based on "loss experience," with the average number being 1.0. A modifier of 1.2 means a company is 20 percent over the average loss number–and the number stays with the company for three years. What's more, Chilton says, is "EMR is a growing factor in getting new business, and these losses affect a company's bottom line. If they can't compete for new business because of a questionable EMR, it really affects their net income."

McKenna

The solution, Chilton says, is for companies to monitor their safety, training, and all insurance-related programs very closely. "The biggest thing companies DON'T do is monitor their own programs. They have to look at the programs they wrote, then monitor and make sure the procedures are being followed."

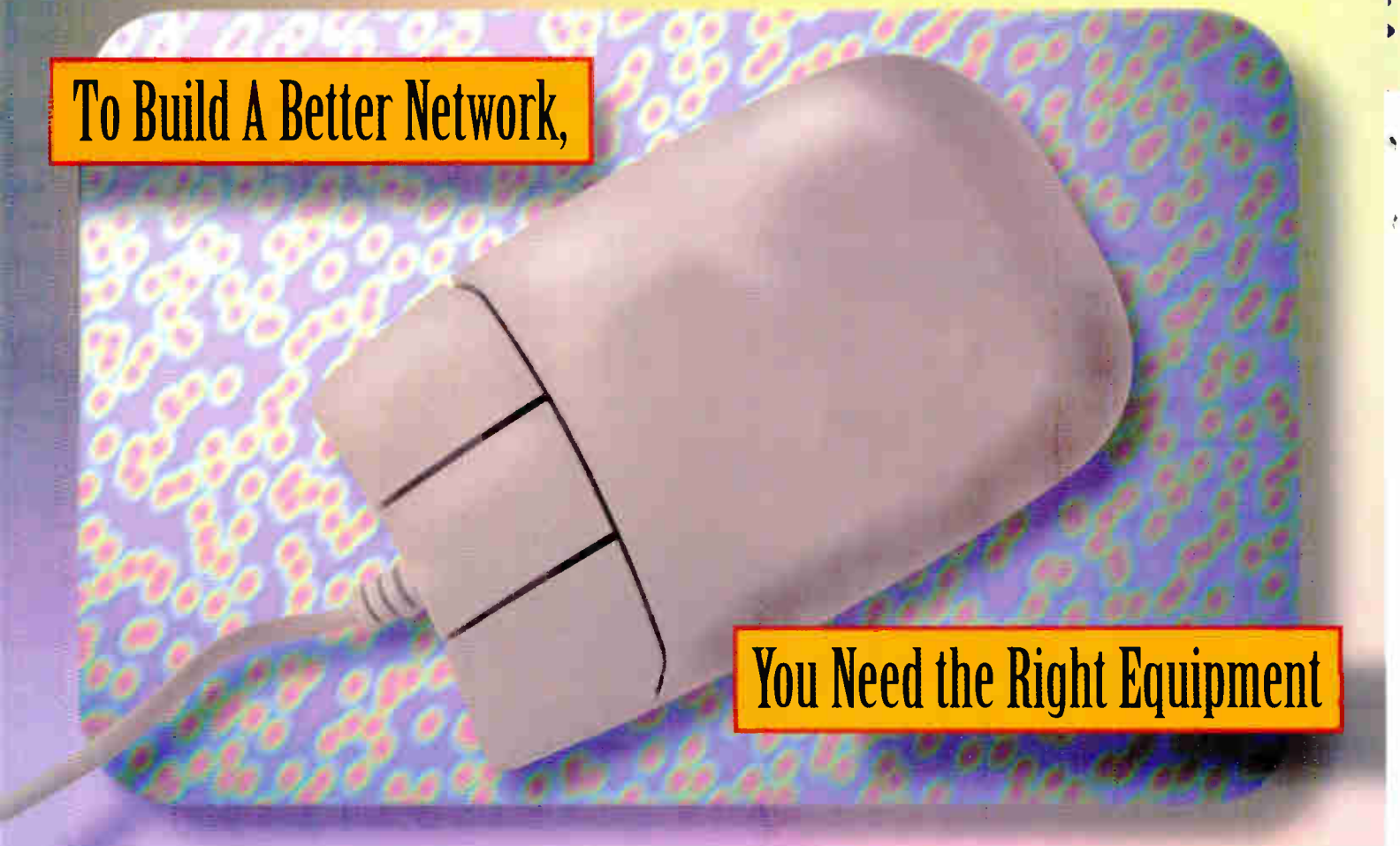
Some smaller cable operators are joining workers comp "pools" which spread the costs of premiums among several other companies. At Massillon Cable in Massillon, Ohio, President Bob Gessner says it has helped keep his costs down. "We started in a workers comp pool with a number of small companies, and it has reduced our costs a lot."

Another cost-saving plan for Gessner and Massillon is a monthly premium for current inventory. "We are only charged for what's in our inventory that month. Each month, we send a list of what we want to insure. For instance, some months we have more convertors and taps than other months, so we only pay premiums to insure the inventory we have in the warehouse."

More cable operators are finding that creative approaches to their insurance needs are paying off. For some companies, however, creativity itself is a growing source of concern, as they struggle to find ways of protecting their intellectual properties. Says McKenna of Jones, "Most of us don't even understand the risks associated with intellectual properties, even insurance companies. It's so new and different, it will require some looking into, since many cable companies are going into the phone and Internet delivery businesses."

And, with the lines between video, telephony and other ancillary industries being re-drawn daily, a major challenge for cable operators as they insure their bottom lines will be to distinguish just what those insurance needs will be as they cross those lines. Continues McKenna: "Going from video to telephony and to software/Internet are all new opportunities. The biggest challenge to us is to answer the question, 'What are the risks?' No one knows what the losses will be because there's no loss history."

As the cable industry moves into new business opportunities and continues crossing the lines into telephony, software, Internet and more, it will create its own history. And how each cable operator maps its own insurance path will determine just how its revenues will be affected. So, history (in this case, loss history) will indeed be the judge. **PMR**



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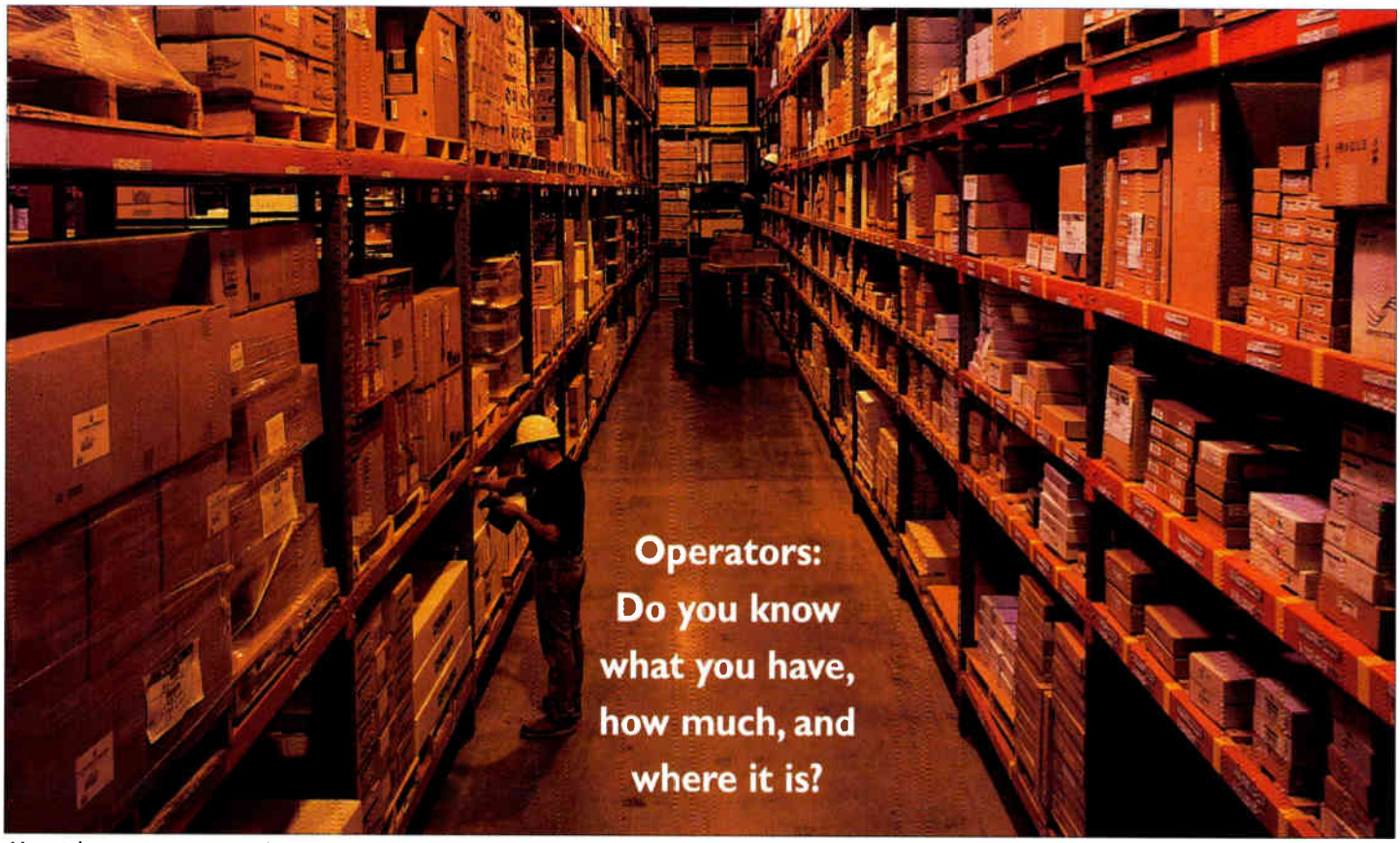

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Materials management providers maintain distribution centers allowing operators to reduce or eliminate inventory investment and related infrastructure costs.

Taking control of materials management

By Laird Simons, Vice President and General Manager, Public Networks Division, Sprint North Supply

What sets you apart from your competitors? Is it the strength of your network, the dependability of your product, the quality of your customer service, your time to market? Or, is it the way you order parts?

For companies that have never considered materials management to be their core competency, outsourcing this comprehensive and time-consuming task has become increasingly popular–and increasingly cost-effective–since deregulation. As marketplace competition, and the corresponding headaches for operators, have mounted, so has the trend toward materials management outsourcing. Several manufacturers and distributors now offer materials management services, but what they provide varies dramatically from program to program. This fact presents challenges in comparing services offered by competing vendors and complicates the selection of a materials management partner. Nevertheless, outsourcing materials management can help to improve project efficiency and make the critical, bottom-line difference in today's competitive broadband communications marketplace.

For example, the author's company says its materials management program can save customers 25 percent to 40 percent of their total procurement costs when compared to going it alone.

"The amount of money saved varies from company to company, but savings occur through reductions in

both procurement and operational expenses," says Bill Winslow, Sprint North Supply director of sales.

Making the decision

The decision to outsource materials management is sometimes a CFO's call, based on the desire to cut costs while enhancing quality. Materials management services achieve both, helping to improve a company's processes and increase productivity in procurement, engineering and installation, warehousing, accounting and transportation.

If you are contemplating outsourcing materials management, consider:

•Procurement issues–from supplier qualification to bidding to warranty administration–are all handled for you.

•Materials management programs reduce shrinkage and cut the infrastructure costs associated with private warehousing. They also reduce the taxes companies would otherwise pay on the inventory on their shelves.

•Electronic commerce allows you to order products and manage transactions efficiently and with minimum paperwork.

•You can forget the piecemeal approach to ordering products. Materials management experts secure the products from the manufacturers you specify, or make recommendations for appropriate products, then deliver them in a single shipment. You track material from only one source and pay only one invoice, as opposed to dozens.

•Materials management services eliminate the risk of product obsolescence. Rather than languishing for weeks or months on your warehouse shelves as technology marches forward, the products you receive employ state-of-the-art technology.

•Providers who offer service guarantees create a product safety net in case of emergencies.

•Materials management providers relieve engineers of the need to manage complete projects. Instead, engineers can hand off the segments of projects they cannot efficiently manage, freeing them to focus on designing and building their networks.

"What cable TV does best is provide broadband communications services to customers," says Steve Holt, marketing manager at Sprint North Supply. "Those companies are in materials management because, traditionally, it was necessary to build their systems." But it doesn't have to be that way. "There's no reason a chief engineer should be tracking down materials," Holt says. "With materials management services, the engineer can specify products and manufacturers and let (distributors) take it from there."

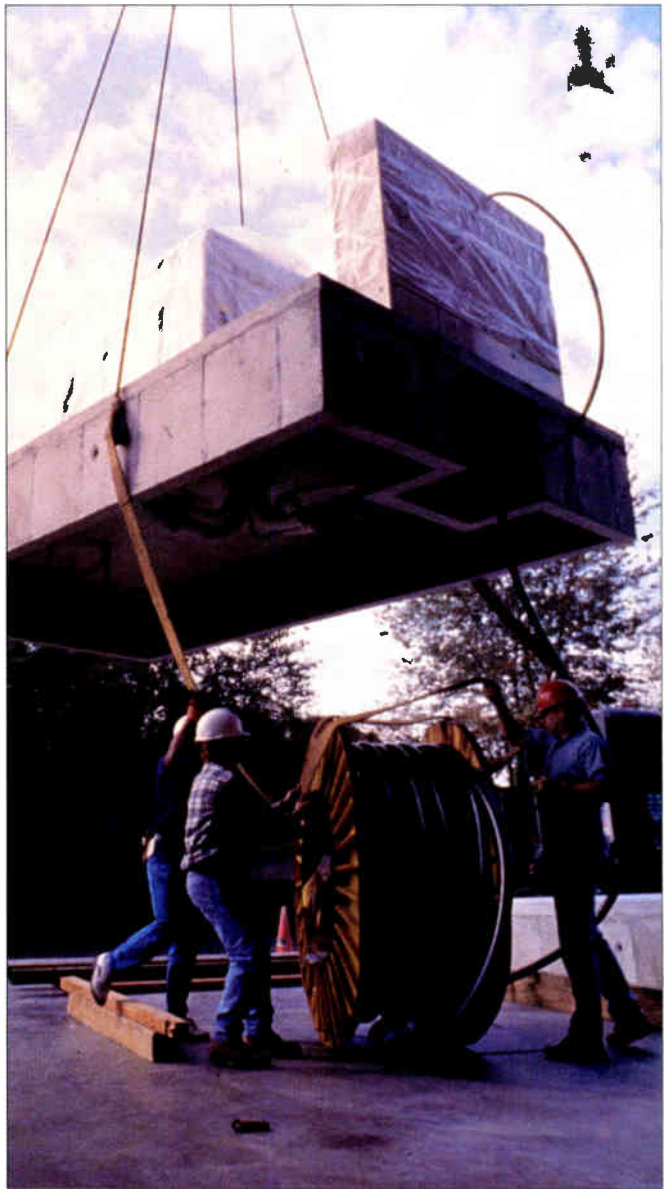
How materials management works

Just as competitive cable companies offer their customers a spectrum of channel choices, competitive materials management providers offer a broad portfolio of services. Often, such programs can be tailored to the customer's needs. For example, materials management can range from project work to the complete handling of all warehousing and distribution. The most comprehensive programs are comprised of many components, including project management; engineer, furnish and install (EF&I) services; modeling; vehicle provisioning programs; and CPE fulfillment. (See sidebar, page 24).

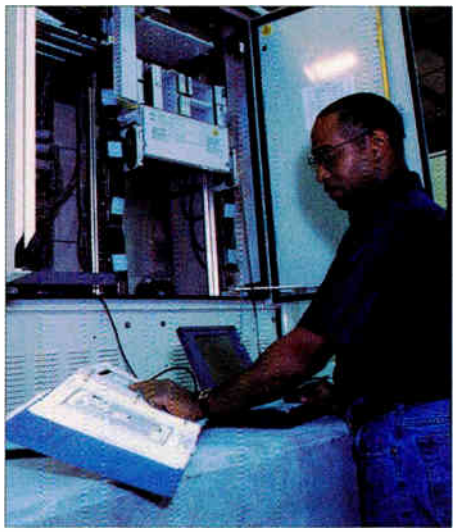
•Project management. For engineers who need hundreds of products from dozens of suppliers, outsourcing materials management can create an immediate boon. Tailor-made, online project management databases exist to allow instant inventory control. This service also includes construction schedule monitoring and management of distribution, inventory control and transportation.

•Engineer, furnish and install services. With one call, one order and one invoice, EF&I solutions free companies to concentrate on their core competencies. Through this program, the materials management services provider handles the engineering, installation, staging, preassembly, delivery, site preparation and turn-up of any project, and can select the best equipment and materials available from multiple vendors in order to serve each customer's unique needs.

•Modeling. If you're doing it in-house, setting up



A supplier delivers and installs a custom-engineered digital loop carrier (DLC) site in one complete package.



To complete the EF&I process, a system test and burn-in of all electronic components of a DLC system is performed.

new systems is both time-intensive and costly. It's not just the planning, customizing and designing that makes this so. It's also the ordering, tracking, receiving, wiring and testing. Modeling programs save both time and money, because the materials management experts work with multiple vendors to find the best products at the best prices, and then streamline product delivery. This system standardization also allows for more accurate budgeting and forecasting, as well as consistent maintenance and provisioning of spares throughout a network.

•Vehicle provisioning programs. Vehicle provisioning programs allow installers to leave the warehouse with customized orders and fully replenished trucks. Vehicle inventories are fine-tuned and standardized, so that vehicles essentially become warehouses on wheels. Each vehicle carries the same products and, at the end of the week, receives replacements for what was used during that week. The installer's productivity increases; the company's inventory decreases because the program makes a moot point of lead time and overbuying or underbuying certain materials. Companies gain more efficient use of vehicles and employees, and improved customer service is one important result. As needed, the program can also be used for technician or project provisioning.

•CPE fulfillment. Comprehensive materials management services eliminate the need for a customer premise equipment (CPE) inventory and fulfillment infrastructure. After sourcing the best products and developing an appropriate equipment list, the distributor can maintain the CPE inventory and provide on-time fulfillment to support end-user ordering and customer service operations.

Looking ahead

Materials management alliances promise to factor, rather dramatically, into communications companies' cost control, time to market and profitability. Likewise, materials management providers will also add services that further streamline product ordering and project management.

The manufacturers and distributors that continue to succeed in providing materials management services over the long term will be those who know that cus-

A full menu of services

Distributors who provide comprehensive materials management programs offer an expansive menu of services to help an operator reduce costs and boost productivity. You can choose from these services, described below, to tailor a materials management program that best fits your needs.

•Assemble, wire and test. You receive a custom-designed, multi-supplier solution that comes in one pre-assembled and tested package.

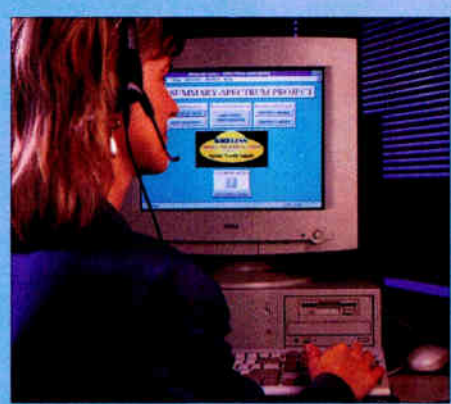
•Asset tracking and tagging. Through a management report, materials are tagged before shipping, and customized databases track materials to your job site by serial number.

•Cable cutting. By accessing the distributor's extensive stock of cable, with full-service cutting and delivery in the exact amounts and types you need, you reduce inventory costs, waste and down time.

•Contract management. You benefit from the distributor's successful experience in negotiating and tracking costs, discounts, rebates, return privileges and so forth.

•Customized transportation. For territories that require dedicated truck routes to meet required delivery schedules, the materials management provider designs and delivers cost-effective mapping.

•Electronic commerce. Technology that permits for electronic data interchange (EDI) helps you compete by managing transactions efficiently. And, coupled with electronic funds transfer (EFT) capabilities, it allows you to improve accuracy, reduce data entry and operate in a virtually paper-free environment.



Software for project materials reporting is tailored to customers' needs.

•Emergency response. Response teams stand by 24 hours a day with key products and capabilities to help you meet your customers' needs in times of emergency.

•Forecasting. Advanced technology helps you maximize service levels and avoid unnecessary costs by viewing past purchasing history and mathematically predicting future needs.

•Kits and bills of materials. You designate specific products you want regularly shipped together as a single package, and the distributor delivers them under one bill of materials.

•Management reports. The distributor provides timely, accurate information on material usage; small, women and minority-owned business utilization; back orders; service levels and more.

•Process consulting. The distributor's expertise enhances your materials management processes and reduces costs in procurement, logistics, finance, information services, contract management and more.

•Procurement. From supplier qualification

A customer-defined fiber optic termination bay is assembled.

tomers' needs, as well as technologies, are constantly changing. Those leaders will continually develop new services and programs to meet these changing needs. **PMR**

to bidding to warranty administration, the materials management provider helps you save time and money throughout the product procurement process.

•Public warehousing. By operating distribution centers around the country, materials management providers allow you to eliminate shrinkage and free your personnel and facilities for other uses.

•Service level reporting. The distributor provides service reports on established performance goals, such as on-time shipping, purchase volume and order accuracy.

•Staging and consolidation. The distributor collects products from various manufacturers and delivers them to you in a single shipment, thereby streamlining procedures and lowering your operating costs.

•Standardization. The materials management provider ensures the highest quality products at the best value by identifying product standards and developing relationships with key suppliers.

•Supplier performance. On your behalf, the distributor routinely identifies quality suppliers and formally contracts them to specific performance and value standards.

–LS

UNCLE SAM WANTS YOU FOR EAS

PHOTO BY THE STOCK MARKET

Uncle Sam may want cable operators' participation in the Emergency Alert System (EAS), but he's not quite ready to direct his new recruits yet

By Dana Cervenka

Cable operators are ready to sign on in the service of their country by participating in the Emergency Alert System (EAS), but their recruitment has been delayed. As was announced early last month, the FCC has postponed the release of its Second Report and Order on EAS. The First Report and Order had given cable operators a deadline of July 1, 1997 to be in

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The trusted name in EAS–Frontline/IAS. Our Product's proven reliability, expandability, ease of use, and extensible features provide the answers that give you the product you need for today and into tomorrow.

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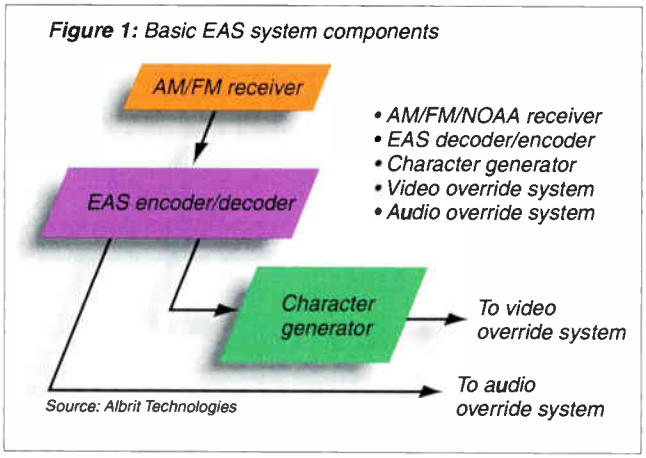


Figure 1: *Basic EAS system components*

compliance with the EAS rules, a deadline which is now null and void.

Several issues need to be resolved before the second order is released, including the question of "small" operators (how many subscribers constitutes "small," and what type of relief small operators may get), the issue of how to meet the needs of the hearing impaired, and which channels will have to carry the EAS message.

As for when the FCC will make its final decision on cable systems and EAS, it's a big question mark.

Once the Second R&O is adopted, whenever that occurs, cable operators will have some time to comply, according to a source at the Commission, speaking on background.

Given the delay, what can cable operators do *now* to prepare for compliance? "You can do some planning, look to see what kind of resources you are going to need, but as far as purchasing equipment, we are kind of advising people to take a 'wait-and-see' attitude," says Steve Johnson, senior project engineer, department of engineering and technology, Time Warner Cable, who also chairs the SCTE's EAS Subcommittee. "We are pretty certain on systems having 10,000 subscribers and above on what will be required–it will probably be full audio and video override on all channels. But there may be other things in the Second Report and Order that would influence what type of equipment you buy."

Some sources of EAS information

- **FCC (web site: FCC.gov/cib/eas)**
- **EAS vendors**
- **SCTE's EAS subcommittee**

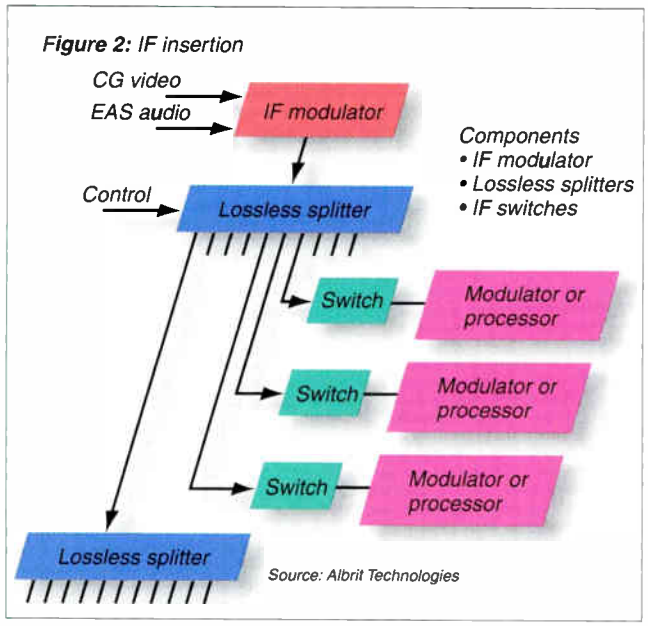


Figure 2: *IF insertion*

The FCC source concurs. "If you do EAS audio and video messaging on all channels, you are going to comply," he notes. "I don't think that there is anything more we could ask a system to do."

The First R&O contains another, less expensive option: the EAS audio and video message would be placed on at least one designated channel, while an audio alert message and some type of video interruption (e.g., a blank, flashing screen) would alert viewers on all channels to tune to the designated alert channel. "I don't think this option will be dropped (in the Second Report and Order)," says the FCC source, "because it is already in the rules."

As far as cost is concerned, there are various estimates floating around in the industry as to what the bill will be for cable operators to comply with the FCC's EAS requirements. "At the very low end, we have estimated around $7,000 to $8,000 per headend," says NCTA VP of Science and Technology Wendell Bailey. "We premise that on the assumption that, on average, we are talking about a 40-channel headend."

For straight video replacement, the cost is somewhere in the neighborhood of $40-50 per channel, according to Johnson, while estimates for placing a text crawl on top of programming are in the $400 per channel range. In addition, these estimates do not include the encoder/decoder and controller required for each headend, at a cost of approximately $6,500 per headend.

Distribution options

While the basics of a cable EAS system are pretty much determined (see Figure 1), the big questions revolve around the distribution of the messages themselves. Operators have already begun the process of weighing trade-offs in cost, degree of programming disruption, and efficiency, as they contemplate various distribution options.

There are several distribution options for EAS, including RF solutions, IF switching, baseband switching and text crawl. Possibly the cheapest option, says Alan Cowe, president of EAS equipment provider Albrit Technologies, is using an RF comb filter to cut off all channels, and then using a character generator display message on all channels. "If you have a small system and you can't afford to rewire it, that may be the prudent solution," he notes.

HollyAnne Corp. Vice President Dave Halperin notes that RF solutions are relatively easy to install, at about two hours, while installation of a baseband or IF system would take longer by a factor of as much as 20 to 30.

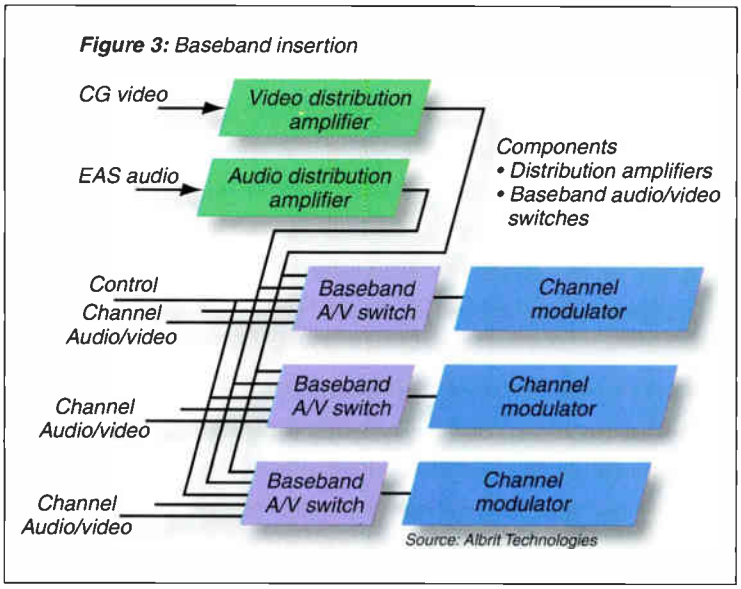


Figure 3: *Baseband insertion*

RF systems may be inexpensive and easy to wire, concurs FrontLine Communications CTO Bill Robertson. But both Robertson, Cowe and others point out that every time the EAS system is tested in this configuration, it disrupts the entire cable system–an important consideration, given that EAS tests will have to be conducted weekly and monthly.

Cable operators could also choose the IF (Intermediate Frequency) switching route, placing an IF switch on every modulator and processor in the headend. There are several variations on the IF theme, but the application remains the same. While IF switching has the advantage of affecting only the configured channels, leaving the other channels alone, it still interrupts the programming of those configured channels, says Robertson.

Yet another method is to switch at the unmodulated baseband signal level. Many of the signals in the headend, such as the outputs from studio cameras and satellite receivers, are already at baseband. A baseband switching system changes the signals at the inputs of the modulators and routes the alert to the selected channels.

While baseband, like IF switching, will affect only the configured channels, says Robertson, a baseband system will still disrupt the programming on the selected channels. In addition, baseband systems may require more complex wiring, he notes.

A text crawl solution is a subset of baseband switching, and though advocated by several EAS equipment suppliers as the least disruptive, it may be the most expensive. In this application, a text crawl is sent across the screen, while leaving the original programming itself undisturbed on a particular channel. This set-up requires a character generator for each channel that will have a crawl, and also requires that all signals be at baseband. The ability to selectively place text messages on specific channels presents a host of non-EAS applications. When text messaging is combined with baseband switching, an even greater range of non-emergency applications are possible, according to Robertson.

Some manufacturers and operators are recommending a hybrid approach to distribution to best handle the cost vs. subscriber disruption dilemma.

"I think IF switching is probably the most cost-effective approach," says Time Warner's Johnson, "but it depends on what type of capability you have in the headend already. Operators might want to consider spending the extra money to put a crawl on the more heavily-viewed channels, such as pay services and pay-per-view."

The ideal solution, says Cowe, is to have individual crawls on each channel, used to inform viewers that an emergency exists and which locations are involved; also, to refer viewers to a details channel for more information, including a playback of any audio messages which may have been received.

As a compromise, "some cable systems may want to have 40 or 60 channels switched at IF, so those channels will all switch to a fixed character generator display when there's an EAS message," says Cowe, "and have the crawl equipment to service their PPV and premium channels."

For now, as cable operators ponder their options, they will definitely want to shop around.

Operators should install their systems and become familiar with the operation of the encoder/decoder prior to hooking up switching equipment to avoid any unintentional interruptions, advises Mega Hertz Sales/Marketing Manager Steve Grossman.

Then there's the question of where to get the gear. "We have been encouraging people at Time Warner to buy a full package," says Johnson. "If you buy all of the pieces, put it together and something doesn't work, you are left with having to deal with it yourself. If you buy a package, then you can go back to your vendor and have him support you."

Ultimately, it's important to remember that, as the FCC source puts it, "We just don't know what the final requirements will be yet." **PMR**

Some suppliers of EAS gear for cable systems

Encoder/decoders
HollyAnne Corp.
Sage
TFT Inc.

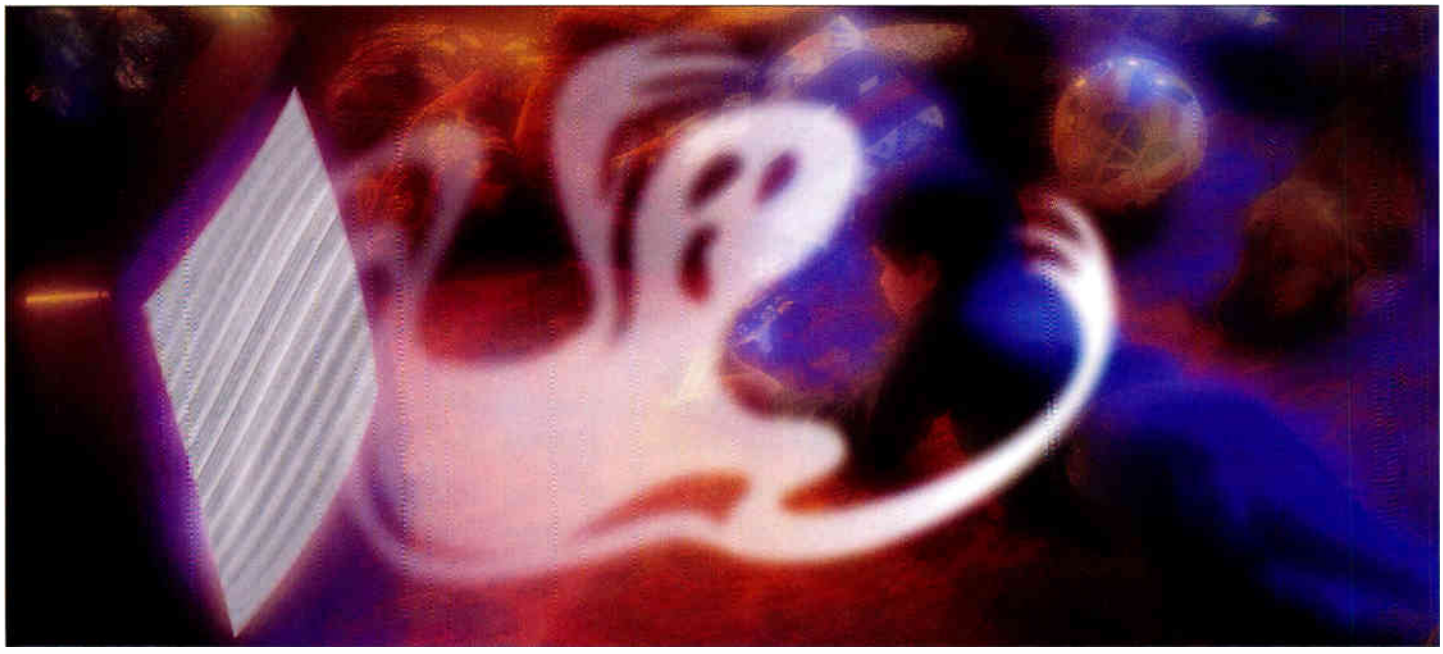
EAS packages
Albrit Technologies Ltd.
Best Tech Inc.
CADCO Systems Inc.
ComTech Services
Dawn Satellite Inc.
D. Co Marketing Inc.
FrontLine Communications/IAS
Idea/onics
Mega Hertz/Spectrum
MicroSat
Sprint North Supply
Trilithic Inc.
TVC Inc.
Vision Telecom

Other solution components
Dialogic Communications Corp.
General Instrument
iCS/Itochu Cable Services Inc.
Monroe Electronics Inc.
R.L. Drake Company, The
Tekron Communications Systems
Thunder Eagle Inc.

Source: *1997 CED Broadband Communications Buyers' Guide* and editorial interviews. *CED* is not responsible for any omissions or inaccuracies.

EMF

The invisible headend plague



Ridding your system of uninvited guests

By J. Terry Turner, Vice President–Client Services, VitaTech Engineering Inc. E-mail: emf@mnsinc.com

For chief engineers at cable TV headends and broadcast television systems, electromagnetic fields (EMFs) are uninvited guests that staunchly occupy a variety of critical production spaces. Inasmuch as the facility must have electrical power and radio-frequency (RF) communications, EMFs are an aggravating by-product that engineering managers should understand and be prepared to address.

Compounding the challenge is the fact that EMFs cannot be seen, heard or felt–even though they can penetrate virtually all objects, including buildings and people.

Editors, control room and videotape operators, production staff and especially maintenance engineers become aware of electromagnetic interference (EMI) from alternating current (AC) power sources when the emanating magnetic fields generate screen jitter in computer and television monitors, noise in signal cables and data errors in digital systems. There is also conflicting research linking AC power EMFs to health problems, most notably leukemia, cancer, and recently, Alzheimer's Disease.

The key to dealing with the EMF challenge is identifying its sources within or outside a building–keeping in mind that EMFs are present in every building. If employees are experiencing screen jitter/color distortion, data loss or radio-frequency interference (RFI), a professional EMF survey leads to the proper solution(s).

What are EMF sources?

Magnetic fields within a building emanate from transformers, network protectors, secondary feeders, switchgears, busway risers and panels. National Electric Code (NEC) wiring violations can inject ground currents onto the metal conduits, water pipes, building steel and HVAC ducts, generating EMI problems throughout the building. This means that while AC magnetic fields are generally located and mitigated near an electrical source,

Case Study # 647

He has 15 minutes until show and tell, and there's not enough time to put all the pieces together

- Sam & Tiffany cost him a full 5 minutes playing "keep away" with his widgets.
- The instructions come in 3 languages and english isn't one of them.
- He grossly misunderstood the term "pigtail." NOw what?

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be it in the basement or on the 15th floor, magnetic fields can be a challenge throughout a building. While electrical systems within a building are the major sources of EMFs, outside sources can also produce EMI problems. Buildings near transmission lines, subways and electrified-rail systems can experience high magnetic field levels, especially when trains are passing by.

On many roofs and upper floors, radiated EMF energy from a variety of nearby RF antennas and microwave dishes can exceed minimum acceptable human exposure standards (IEEE/ANSI C95.1 & FCC) and be potentially dangerous. Furthermore, as wireless LANs, cellular telephones, microwave and other forms of RF communications grow, so will the RFI problems and potential health risks in all buildings.

Taking all these EMF factors into account, an international bank, in selecting a new headquarters site, had a full-spectrum EMF site survey performed. Microwave and RF levels were recorded around the site at various elevations, as well as magnetic field levels from a nearby electrified rail system (Amtrak and Metro-North), plus all overhead and underground power lines. By including EMF considerations in its planning, the bank knew exactly what potential EMF challenges existed at the site before construction, thereby significantly reducing the mitigation costs by a factor of two to four.

Figure 1: *3-D contour plot–NYC Community College. Data one meter above floor. Peak = 111 mG, mean = 34.5 mG, median = 28.3 mG. Average 34.5 mG room level.*

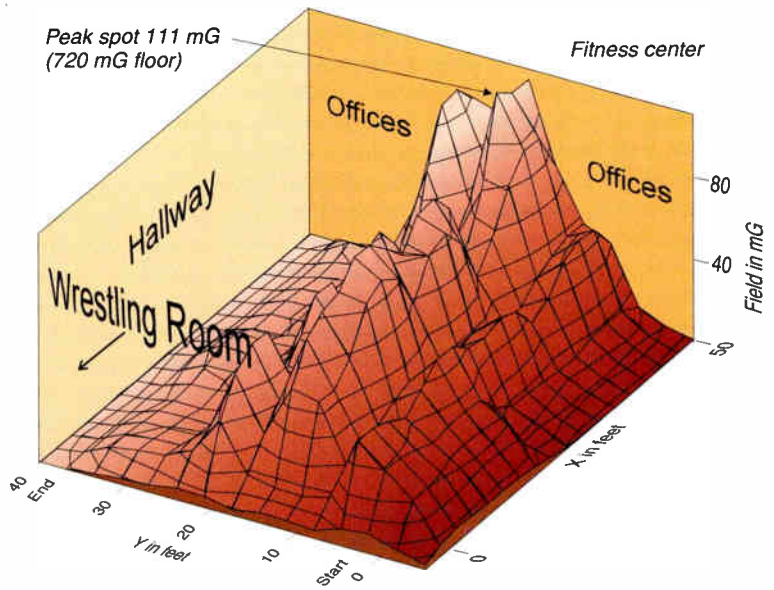
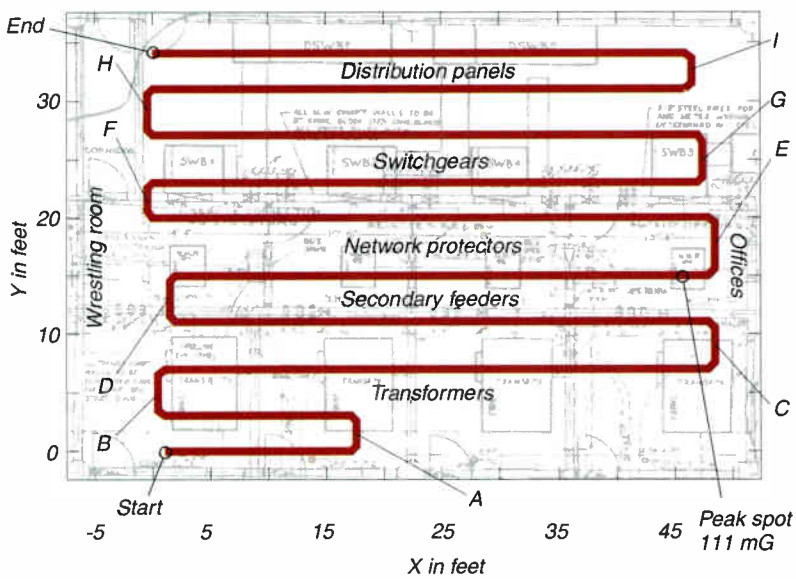


Figure 2: *Map plot–NYC Community College. Fitness Center survey path superimposed over transformers, network protectors, feeders, switchgears & distribution panels. Peak = 111 mG, mean = 34.5 mG, median = 28.3 mG*



Selecting an EMF survey

Because EMFs are invisible, only a detailed EMF site survey can identify the EMF source(s) and evaluate the potential EMI/RFI impact on the local building environment (room, equipment and people). Usually the EMF source is obvious because the computer screen jitters near an electrical switchgear room, or the screen changes color as a subway passes.

However, complex EMI and RFI equipment problems can be generated by plumbing currents on water pipes, magnetic resonance imaging (MRI) or uninterrupted power supply (UPS) units, shorted electrical equipment and from RF sources such as nearby VHF/UHF/FM antennas, airport radar and landing systems, roof-top antenna farms, police/ambulance vehicles and hand-held transceivers (cellular, CB, mobile, etc.).

There are three types of commercial AC power EMF surveys in use today: spot, contour and dosimetric. A three-axis gaussmeter is used to measure the resultant magnetic flux density emanating from electric power sources in milligauss (mG).

Production areas such as studios, control rooms, editing suites, graphic, videotape playback and commercial cart areas are generally surveyed for AC power magnetic fields using the spot or contour methods, with contour surveys being favored because each room or area can be measured across a variety of points, providing a clear picture of the magnetic field penetration and levels.

Generally, readings below 10 mG will not interfere with computer monitors, electronic cabling, magnetic media or audio-visual equipment. It should be noted that most videotape degaussers produce very high magnetic field emissions exceeding 1000 mG and should be tested and shielded. As for the health consequences of short- and long-term exposure to EMFs, there is no industry agreement or federal standards at this time.

After the AC power EMF survey is completed, an experienced engineer should provide engineering management with a comprehensive report that includes:

• Recorded contour measurements (with color graphical 2-D and 3-D plots) of the surveyed areas, including selected equipment measurements and noted NEC wiring

A Look Ahead...

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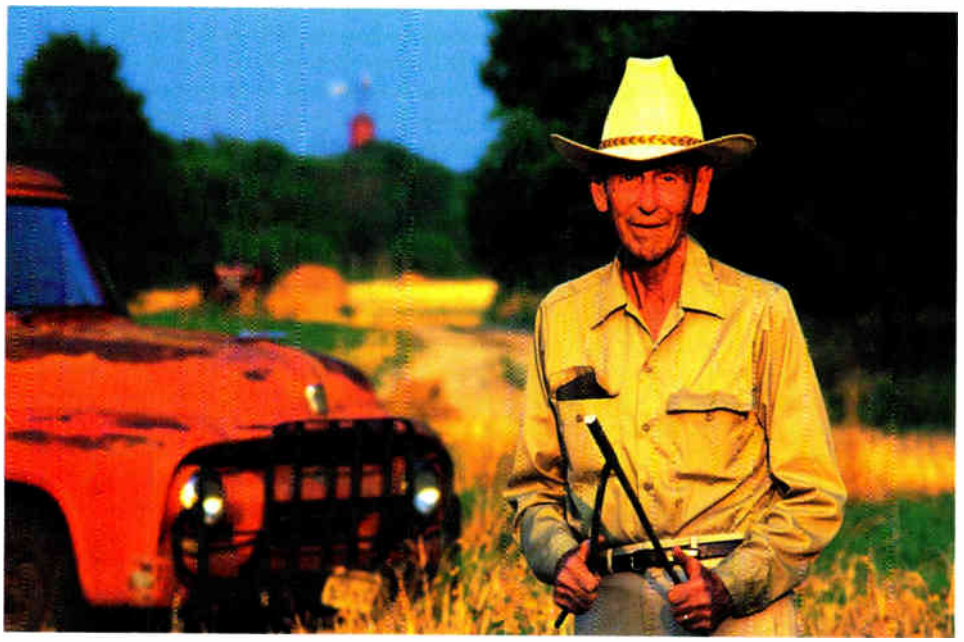

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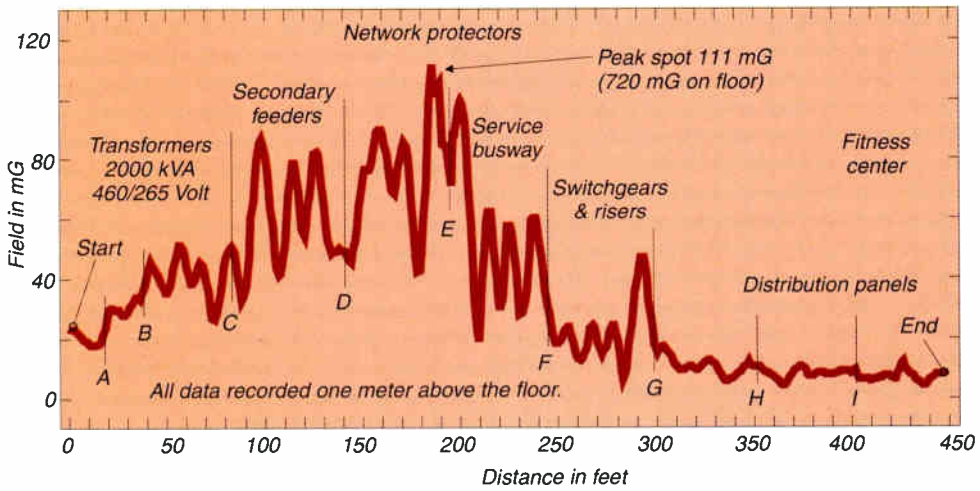
• Risk assessment information.

• Recommended mitigation activities (magnetic shielding, active or passive cancellation, etc.) plus estimated design and installation costs.

Commercial RF EMF surveys measure the cumulative RF radiated energy within offices, work areas, computer rooms, laboratories, emergency rooms, clinics and roof-top transmitters, transmission lines and antennas. When RF levels exceed the minimum recommended human exposure standards (IEEE/ANSI & FCC), immediate action is mandated to protect the occupants from possible harm. Also, RFI equipment susceptibility must be evaluated in the RF survey report. In elevated RF environments, special test equipment is required to locate, log and identify the RF radiated sources (and owners) by frequency and field strength.

Figure 3: *Profile plot–NYC Community College. Fitness center profile plot with turnmarkers (letters A-I). See Figure 2 for exact locations. Peak = 111 mG, mean = 34.5 mG, median = 28.3 mG.*



EMF mitigation solutions

Depending on the EMF survey results, the engineering management may decide to implement one or more EMF mitigation solutions, depending on the levels and type of EMF source: DC power (subways), AC power (electrified trains), computer monitor emissions, RF and microwave. There are five basic mitigation strategies:

1. If excessive AC power magnetic fields are emanating from water service lines (plumbing currents caused by electrical current attaching itself to metal water pipes), the installation of a dielectric coupler should eliminate the problem.

2. If excessive AC power magnetic fields are emanating from the building steel, HVAC ducts, metal pipes and conduits, then locating and correcting the ground current sources (NEC violations or shorts) should reduce or eliminate the problems.

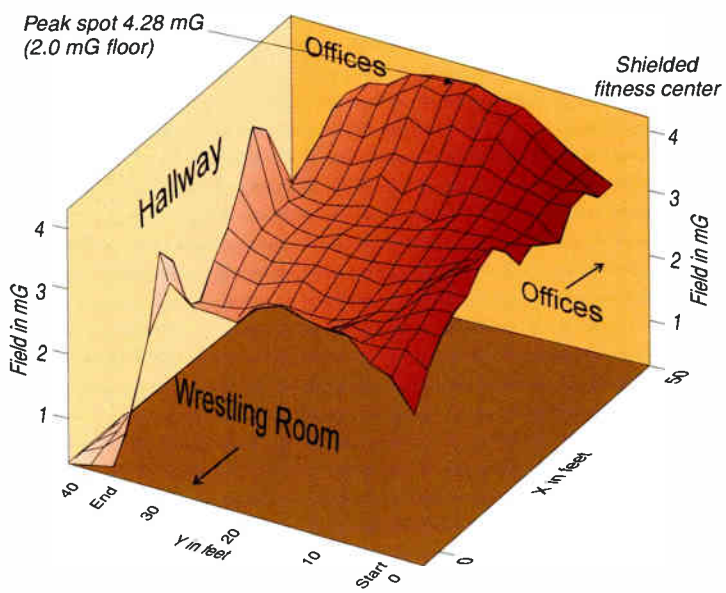
3. Prudent avoidance, which requires that people or the AC power magnetic source be moved a safe distance away (EMF exposure diminishes quickly over distance). In broadcast television and cable TV buildings, it is highly unlikely that production space will be vacated permanently to solve an EMF exposure challenge.

4. If the EMF sources emanate unaccepted levels from outside the building (power lines or RF/microwave signals from nearby antennas), then AC power magnetic field cancellation technology or RF shielding will have to be implemented. Building size severely limits the use of this mitigation solution. Radiated RF/microwave signals can be mitigated by the application of special conductive window coatings electrically grounded to foils (aluminum/copper) or conductive paints on the walls and floors.

5. When AC power magnetic field levels exceed 10 mG and production space cannot be used as a barrier between people, computers and the EMF source, then magnetic shielding is the only viable solution. Two approaches can be utilized: Shield the EMF source; or shield the room and people.

Shielding the source is the most effective and least expensive alternative available with magnetic shields. However, if there are multiple magnetic field sources (parallel transformers, network protectors, secondary feeders, switchgears, busways, risers, UPS units, etc.) or the sources are not readily accessible (buried underground or spread out behind walls, etc.), it may not be economically feasible to individually shield each source. The solution then becomes one of shielding the production area in which people work and EMF sensitive equipment is uti-

Figure 4: *3-D contour plot-NYC Community College. Data one meter above floor. Average 2.96 mG room level. Peak = 4.28 mG, mean = 2.96 mG, median = 2.96 mG.*



lized. This solution is selected most often.

Magnetic shield example

Recently, the author's company accepted a unique challenge from a New York City community college where peak readings in a fitness center were 111 mG at a height of one meter above the floor (720 mG on floor). The facility was directly over four transformers, network protectors, feeders and switchgears. The college asked for and received a magnetic shield that would reduce the average room levels to 3 mG.

A 3-D contour survey was performed to ascertain the milligauss levels of AC magnetic-field penetration throughout the room, as shown in Figure 1. The survey path followed to measure levels throughout the facility is superimposed in Figure 2 over the EMF sources–transformers, network protectors, feeders, switchgears and distribution panels.

In this presentation, it becomes clear that it would be impractical to shield each individual source; a better option would be to shield the entire room from the multiple sources below. In Figure 3, the survey plot of the fitness center shows the levels emanating from each electrical source. By comparing the capital letters in Figures 2 and 3, management can correlate the readings with the exact location of each electrical source.

With this information, the shielding engineer can determine the area to be shielded and the shield design necessary to produce the required final milligauss levels. In this particular case, it was necessary to shield the floor and all four walls because the facility was used as a day-care center. To achieve the 3 mG average levels, the engineering team created a multilayer, three-substrate shield consisting of welded aluminum plates and layers of silicon-iron and mumetal sheets.

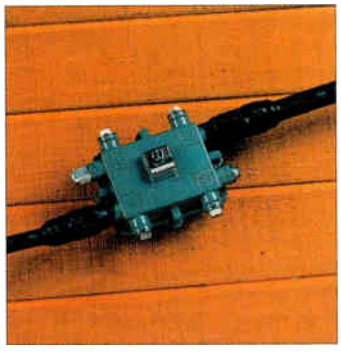
After the magnetic shield was installed, the survey engineer conducted a final contour survey to verify results. In Figure 4, the final milligauss readings show that the average 3 mG target was achieved throughout the facility with a level of 2 mG on the floor. By comparing Figure 4 (after the shield was installed) to Figure 1 (before the shield was installed), management can see exactly how the milligauss levels were reduced in correlation with the electrical sources producing the emissions.

Obtaining this type of success with hard-to-manage AC power magnetic fields is only attainable through the proper use of state-of-the-art instruments, experienced survey techniques and expert EMF engineering services (shield design, installation and final verification). Using this professional approach, AC power magnetic shielding performance can, and should be, guaranteed. **PMR**

Heat-shrink tubing

AUSTIN, Texas–Tubing that provides reliable environmental protection for cable television equipment above ground and underground is now available from 3M Telecom Systems Division. The new 3M brand CCT heat shrink tubing protects splices, trunk amps, line extenders, splitters, ground blocks, drops and taps against damage from UV, temperature, water, chemicals and mechanical strain.

The CCT heat shrink tubing has a cross-linked polyolefin outer wall that is resistant to sunlight and weathering. Its adhesive lining functions as a sealant to prevent moisture and corrosion damage. 3M CCT heat shrink tubing shrinks to one-third of its expanded size, forming a strong protective barrier against vibration and movement.



3M brand heat-shrink tubing

The tubing also makes installation easy and efficient, says the company. Two thermochromic stripes darken when the tubing has been installed properly. The tubing has an adhesive lining designed to make stripping and re-entry easy by merely reheating the tubing to soften the adhesive. Because applications and cable sizes vary throughout the industry, the tubing is available in eight different diameters, from .400 through 3.00 inches.

Circle Reader Service number 351

Millennium Power Inc.'s vehicle-mounted invertor

Power invertor

SEATTLE, Wash.–Millennium Power Inc. is introducing a vehicle-mounted service and maintenance invertor, which converts the 12 VDC truck battery power to 120 volts AC sine wave for power tools and test equipment operation in construction, testing and maintenance.

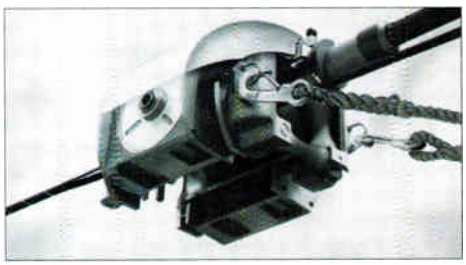
In addition, the invertor also provides a 60- or 90-volt AC quasi-square wave output that can be directly connected to the cable TV system to temporarily bypass existing power supplies for service and maintenance or during outages.

Thus, every truck can essentially have a power supply mounted to it to provide emergency power bypass and outage restoration.

Circle Reader Service number 350

Cable lashing machine

TREVOSE, Pa.–General Machine Products Company Inc. (GMP) has announced its Apollo Aerial Cable Lashing Machine, which provides reliable parallel pull at very low weight. The new lasher securely lashes single or multiple installations of all types of telecom cables, including copper, fiber and coax. It can also lash combinations of cable and innerduct. All-smooth edges provide 360-degree protection against cable damage. The Apollo weighs in at under 35 pounds without lashing wire. It can lash cable bundles up to four inches in diameter, to strands 1/4 inch through 3.8 inches in diameter.



GMP's lashing machine

Circle Reader Service number 352

Rigid rail system

FREMONT, Ind.–Sur-loc Inc. has introduced the patented "Climber's Buddy" rigid rail system to ensure the safety of those working on industrial ladders and towers. Developed by engineers and professional riggers, the system features an instant grab-action cam, locking climbers to the rail if they lose their footing. The cam is mounted to an aluminum or fiberglass ladder and incorporated safety rail, and will lock into position during a climber's ascent or descent. Aluminum and fiberglass safety rails are also available to retrofit existing ladders.

Sur-loc's Climber's Buddy

The standard aluminum rail and mounts weigh 2.5 pounds per foot. The fiberglass rail is non-conductive and non-corrosive.

Circle Reader Service number 353

Cable tie tools

TINLEY PARK, Ill.–Panduit Corp. has announced two, new battery-powered, automatic Cable Tie Installation Systems: PET1M and PET1.5M. The portable tools are designed to install Panduit continuously-molded, miniature cross-section ties in less than a second. A narrow nose allows installations to be performed even where space is at a premium. In addition, the tools' ergonomic and lightweight design reduces operator fatigue and makes the equipment easy to use, says Panduit.

Panduit's cable tie installation systems

The tools are offered with a choice of three electric power options: a NiCd Battery Cartridge with a one-hour charge time, capable of installing up to 200 ties; a Rechargeable Battery Belt with a charge time between four to six hours, capable of installing up to 2,000 ties; and an AC adaptor that provides unlimited use.

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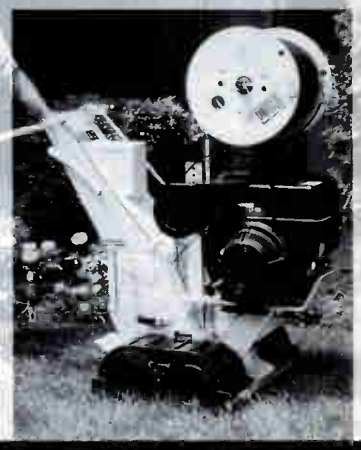

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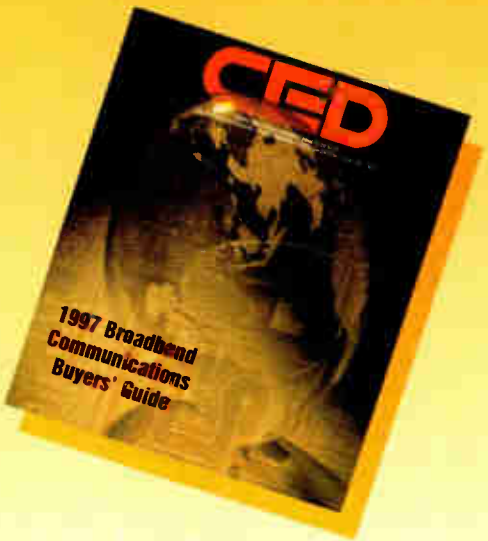

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Optical fiber identifiers

UTICA, N.Y.–GN NETTEST's Laser Product Division has introduced two new optical fiber identifiers, the F1720 and F1720C. Both models are designed for non-destructive identification of optical traffic on single-mode fiber using local detection technology. This non-destructive macro-bend method of detection reduces the probability of an interruption in service by eliminating the need to open the fiber at the splice point.

GN Nettest's fiber optic identifier

The F1720 measures from 0 dBm to -40 dBm, while the F1720C is specifically designed for use in cable TV applications measuring from +20 to -20 dBm. Both models detect continuous wave, live optical transmission and low-frequency modulated tones at 270, 1000 and 2000 Hz.

Illuminated LEDs located on the probe display the presence of traffic, the direction of the transmission and the presence of modulated tones on the fiber. The fiber's relative core power is also measured and displayed on a two-digit LED.

Circle Reader Service number 356

Soldering station

POWAY, Calif.–Wassco has introduced the Weller MT1500 Microtouch Soldering Station. With the unique microtouch technology, the tips stop heating when the soldering iron is put down. This allows the user to change tips quickly, plus it prolongs the life of the tips themselves.

MT1500 Soldering Station

The tip automatically reheats two seconds after the user picks it up. A digital display accurately shows tip temperature. With the optional supervisor lockout feature, the unit can be set to operate at a predetermined temperature.

Circle Reader Service number 357

Riser Bond Model 1270 TDR/fault detector

TDR cable fault detector

LINCOLN, Neb.–Riser Bond Instruments has introduced its new Model 1270, a combination TDR and cable fault locator. The unit combines the sensitivity and length readability of coaxial TDRs with the multiple testing modes of twisted pair TDRs, and contains both front panel BNC and Banana Jack connectors.

The Model 1270 also features an auto-search mode, independent cursors and multi-level/function waveform filtering.

Circle Reader Service number 355

Interface connector

LEDGEWOOD, N.J.–Bomar Interconnect Products has announced the availability of its new Recessed Male "F" Interface Connector.

The connector was designed to facilitate easy and economical adaptor replacements, and for use in applications where push-on plugs eventually erode the integrity of jacks' threads.

Bomar's interface connector

With the recessed male "F" interface, connections are easily renewed by unscrewing the "F" female end of the adaptor and replacing it with another.

Circle Reader Service number 358

Spectrum monitor

WEST PALM BEACH, Fla.–Torifino Enterprises Inc. has introduced its new RF-3200 handheld Field Strength Analyzer/Spectrum Monitor. The unit has been designed for countermeasure applications, testing, installing and maintenance of cable TV and satellite receiving equipment, mobile telecommunications equipment, cellular and cordless phones; and paging systems, as well as installing and measuring antennas.

The RF-3200 features a frequency range of 100 KHz to 2.06 GHz; measures narrowband FM, wideband FM, AM and single sideband signals. Signal levels up to 160 channels can be displayed simultaneously on the LCD.

In addition, the unit features 50 ohms or 75 ohms input impedence; a detachable antenna; built-in frequency counter; audio output for monitoring; and PLL for precise frequency measurement and tuning. The unit also has an RS-232C port for PC interface and printer.

Circle Reader Service number 359

Aerial lift

WESTMINSTER, Colo.–MTI Inc. has added a corrosion-proof option to its Telsta line of aerial lifts with the introduction of its new Pro Glass T-body. The fiberglass body allows for body flexing in uneven terrain and features a modular design for easy replacement.

MTI's Pro Glass T-body aerial lift

Circle Reader Service number 360

The Guardian RSVP™ Return Path Evaluator

BECAUSE MOST INGRESS IS HOMEMADE

With the Guardian RSVP Return Path Evaluator You'll Identify and Stop Ingress at the Source: The Subscriber's Home

Guardian RSVP

It's simple—most return path problems originate in the subscriber's home. Flawed installation, faulty cabling, and mis-installed or loose hardware can disrupt the return path and your system's revenue stream by admitting ingress.

The Guardian RSVP™ return path evaluator puts you in control of the return path one home at a time because the Guardian RSVP hardens your system with each and every installation and maintenance visit.

Working with a Guardian IsoMeter™ reverse leakage detector in the field and a standard Trilithic 9580™ reverse path analyzer in the headend, the Guardian RSVP analyzes the return path as well as the ingress potential and shielding integrity of subscribers' home wiring.

Test The Entire Return Path: Just press "TEST" and the Guardian RSVP quickly determines whether the reverse signal strength needed is within the capability of the set top terminal or modem, then just as swiftly evaluates the carrier/(ingress and noise) ratio from the set top to the headend, providing the installer with a clear "PASS" or "FAIL" message and full measurement data for troubleshooting.

Test Shielding Integrity: By simply connecting the Guardian RSVP to the subscriber's ground block, your technician can flood the home's cabling system with a calibrated return test frequency that makes all leaks immediately detectable to the Guardian IsoMeter.

The Guardian RSVP return path evaluator will help you protect the value of your return path because with the RSVP you'll home in on ingress before it enters your system.

GUARDIAN™ RSVP
Return Path Evaluator

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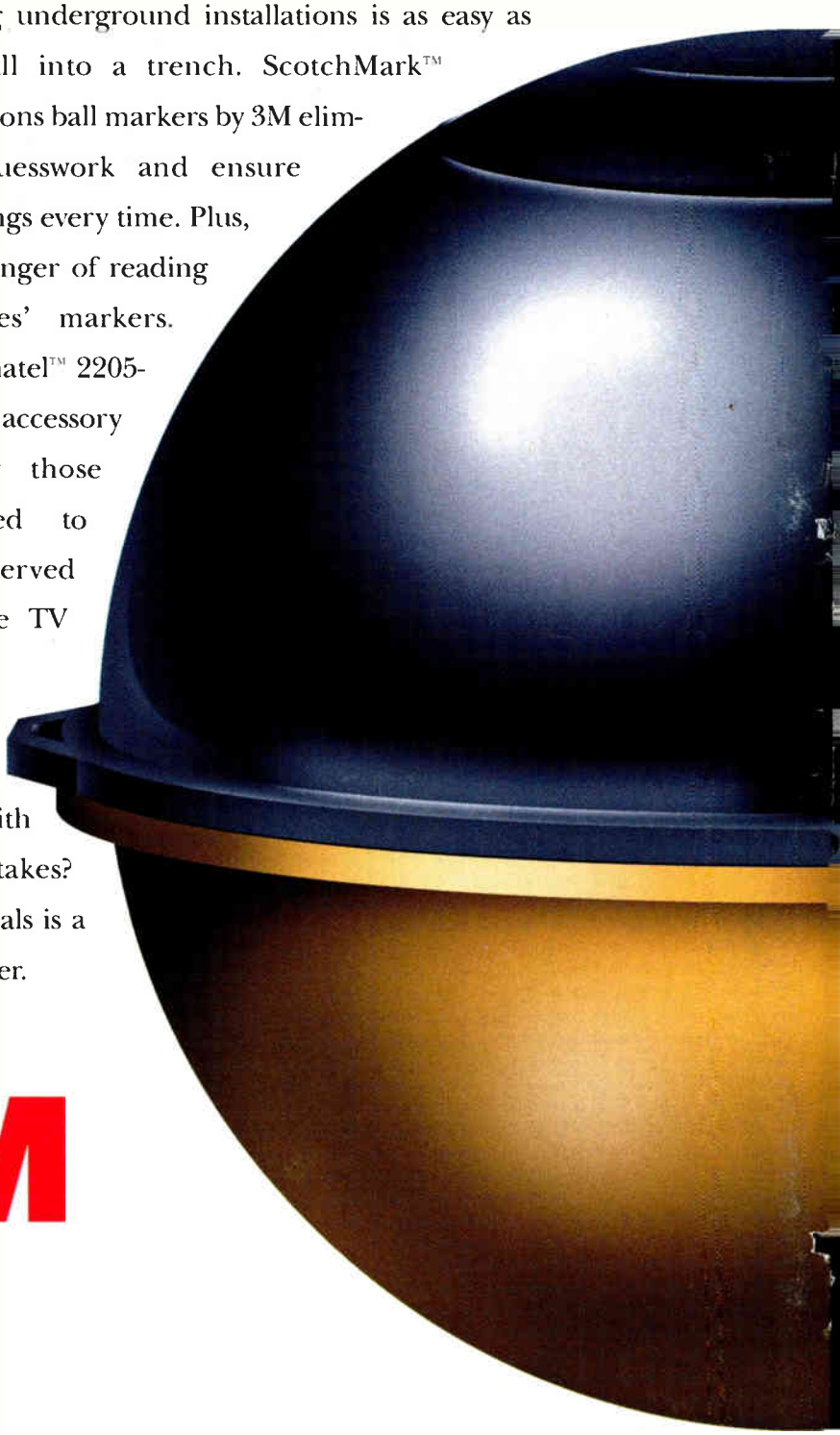
Catch!

Now, locating underground installations is as easy as tossing a ball into a trench. ScotchMark™ Communications ball markers by 3M eliminate the guesswork and ensure perfect readings every time. Plus, there's no danger of reading other utilities' markers. The 3M Dynatel™ 2205-CT locating accessory locates only those markers tuned to licenses reserved for the cable TV industry.



Why mess with flags and stakes? Catching signals is a whole lot easier.

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