



SAABE TIMES

A publication of the San Antonio Association of Building Engineers

May 2002

Mark Your Calendar—

NATURAL GAS CONSIDERATIONS FOR SAN ANTONIO

**Presented by Patrick
Kotara of City Public
Service**

Please join us on Wednesday, May 15 at the Old San Francisco Steakhouse for our monthly membership luncheon. This month's program, presented by City Public Service, features Patrick Kotara speaking about Natural gas cooling.

Natural gas cooling is experiencing a re-birth in the United States, driven by demands for greater efficiency, a cleaner environment, and deregulation in the electricity marketplace. This presentation explores the features and benefits of various natural gas and electric cooling dehumidification systems, and focuses on the advantages and disadvantages of absorption chillers, engine driven chillers, and desiccant systems. Senate Bill 5 and its impact on building owners/operators will also be discussed.

Presenter:

Patrick Kotara is a Project Engineer with City Public Service. He has a bachelors degree in Mechanical Engineering from Texas A&M University, and has more than 20 years experience in natural gas engineering, marketing and transportation. He is a registered professional engineer in the State of Texas. ❖

Education Corner

By Kenny Aguilar

Centrifugal Pumps

May 21-22, 2002, 8:00am to 4:30pm. Cost is \$799.95

During this intensive two day seminar, Consulting Engineers will learn the inside information on why and how pumps are designed. Design Engineers will learn more about the total picture of designing pumps than they could in 20 years of experience. Plant and Maintenance Personnel will learn why pumps work and what causes pump problems.

National Electric Code

June 4-6, 2002, 8:00am to 4:30pm. Cost is \$1099.95

The program is designed to demystify the requirements of the National Electric Code and to provide basic instructions on the newest edition. The design and construction team who know the most current Code requirements will save their clients money, keep costly system incompatibilities from holding up the job, and more importantly will provide a greater degree of protection for the building owner. We will discuss rules to minimize the risk of electricity as a source of electric shock and as an ignition source of fires and explosions.

Location: Clarion Inn Intercontinental Airport, 500 North Sam Houston Parkway, Houston, TX 77060. For more information contact NTT at 800-922-2820 or www.nttinc.com.

Texas HVAC and Refrigeration Contractor Licensing

Construction Data has scheduled several seminars for Texas HVAC and Refrigeration Contractor licensing. The exams have changed drastically and become even more difficult. The state has added many more books, more questions, and taken away some of the time allowed.

- May 10-12 Austin
- June 7-9 Houston
- July 12-14 Arlington
- August 9-11 San Antonio

Seminar cost is \$450, and the instructor is Jay Peters, who has taught these seminars for the last 10 years. To register, receive information, or purchase books, contact Construction Data at 888 500 PASS (7277) or www.hvacandplumbing.com. ❖

A Message from the President by Elena C. Castillo

Electrical Safety

There are two very important issues I wish to convey to the members regarding electrical safety. One is safety in the workplace, and the other is properly testing GFCI (Ground Fault Circuit Interrupter) receptacles in the home to maintain a safe environment for your family.

These two safety topics play an important part in increasing public awareness of the dangers involved in not having a healthy respect for electricity. I will provide a little bit of insight into the advantages and necessities of educating yourselves, as well as passing this information on to others in your workplace or home.

Electricity is sometimes impossible to understand, making it extremely imperative that individuals in the workplace have basic safety knowledge. In most situations, employees have no control over the safety of their workplace environment. Often it is taken for granted that employers will monitor any potentially hazardous conditions and would normally inform their employees to beware of any such conditions. This is not always true, and the fault cannot be placed on the employer. They depend on the knowledge, dedication and communication of their employees to provide a safety conscious workplace. This participation in safety-oriented programs presenting basic knowledge and skills make for a safer workplace environment.

Many unqualified individuals are known to practice electrical work simply because they've "seen it done a million times" and have never had a bad experience. It is these "professionals" who take things for granted and often have a tendency to ignore basic safety practices to get the job done faster or cheaper. Although some of these tasks may be minor, and sometimes considered temporary, they should be performed in a neat and workmanlike manner, and according to all applicable codes and standards.

One example of "Nothing can happen to me" is this picture of the "technician" using a drill on a ceiling, no GFCI attached, on an aluminum ladder, in the swimming pool, barefooted, half-wet, and need I say more? This is an actual picture of a person who considers himself a "professional." (Source: Corps of Engineers Electrical Construction.)



Photo courtesy of Corps of Engineers Electrical Construction.

In the workplace, safety conditions should be monitored closely and taken very seriously as they can affect plenty of people. Many accidents and injuries can be prevented with just a little more attention to basic safety principles. (Source: Electrical Contractor Network)

Have you tested your GFCI today?

An estimated 400 million GFCIs are installed across the country, and many of these receptacles are not working properly. The National Electrical Safety Foundation (NESF) is reminding consumers to test their GFCI receptacles today and every month. GFCIs are electronic devices, which can be damaged or even wear out. The electrical receptacle in a GFCI may continue to function, even if the GFCI circuit no longer works. Most private residences, apartments, hotels, motels, and public facilities built since the early 1970s have one or more GFCI receptacles installed.

These GFCIs have a built-in test button, which should be checked on a regular basis to verify they are working – every month, according to the experts. "Regular testing of all GFCIs is an important part of protecting your family," according to NESF Executive Director Walt Biddle. "This is even more important in locations with frequent and severe electrical storms or power surges."

GFCIs are designed to minimize shock and reduce the chances of electrocution, especially when electrical circuits within appliances inadvertently come in contact with water. GFCIs are most often installed in kitchens, bath and laundry rooms, and out-of-doors, where electricity and water are most likely to be used in close proximity.

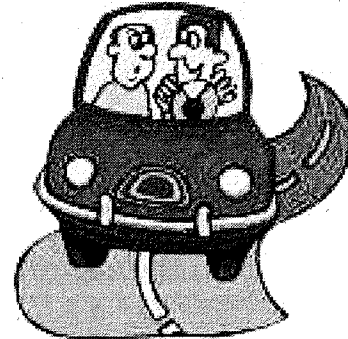
"GFCIs have probably saved hundreds of lives and prevented thousands of serious injuries in the last three decades," Biddle said. "An improperly installed or non-functioning GFCI offers no protection against accidental shock. All these devices must be tested regularly to verify that they are working correctly."

There are three types of GFCIs. The most often used "receptacle type" GFCI, similar to a common wall outlet, is the type with which most consumers will be familiar. Additionally, circuit breaker GFCIs are often used as replacements for standard circuit breakers and provide GFCI protection to all receptacles on that individual circuit.

(Continued on page 6)

April Luncheon: *Are Road Repairs DRIVING You Crazy?*

Then you should have come to our April general membership luncheon at the Old San Francisco Steakhouse to hear when and where these projects will be reaching completion—to give you hope and patience while you wait on the road! Maggie Rios from TxDOT gave us a summary of current road repair projects going on in San Antonio as well as a projection of future projects and the time frames involved. It was encouraging and interesting to hear about all the planning that goes into these projects and that some even finish ahead of schedule! Thanks again, Maggie, for an excellent and highly informative presentation. Please join us this month for another terrific lunch at the Old San Francisco Steakhouse and a great presentation by CPS Gas! ❖



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Tech Talk #60

by The Charlie

DAYLIGHTING (Lighting Naturally)!
(Part Two of Two)

Daylighting Techniques

A number of techniques may be used to provide daylighting. Two of the most common will be illustrated:

Sidelighting: The most familiar approach to daylighting techniques is sidelighting. The quantity of light emitted from side openings, usually provided by windows or glass block, depends on the width and height of the opening above the working plane or systems furniture, the type of glazing, and any control elements, such as blinds, shades or louvers. The effectiveness of sidelighting is limited to a distance into the room away from the windows of about 2.5 times the height of the opening (would you believe it is somewhat further with glass block). Direct sunlight is not preferred because it causes critical brightness and thermal problems, unless selective-transmitting materials, window orientation, or adjustable blinds or drapes properly control it. However, these types of controls can limit the potential interior illumination at times when there is an overcast sky. In this case, supplementary fluorescent lighting with daylight harvesting controls should be considered.

Window openings allow heat to be transferred into and out of the building. Proper control and balance of the benefits and expenses related to this heat exchange need to be considered. Often the benefits of daylighting and winter heat gain through side windows outweigh the disadvantages of summer heat gain normally compensated for by air conditioning.

Toplighting: Skylights and clerestories provide about three times the amount of daylight as vertical windows, and since they can be placed closer to the center of an area, they provide more uniform lighting than windows can provide with sidelighting. Diffusing glazing materials, sometimes in

combination with ceiling louvers or lenses, can be used to control the brightness of direct sunlight and high sky luminance to avoid reducing visual comfort. Total light transmission and toplight surface luminance can be balanced with glazing materials by selecting appropriate transmittance values. Sometimes skylights are applied incorrectly, causing excessive heat gain into the building. However, studies have proven that skylights can be applied throughout the U.S. to provide daylight well within cost-effective considerations.

Although daylighting is not advantageous for existing office buildings, more and more new owner occupied buildings are utilizing daylighting applications in their design. A well-designed daylighting application may optimistically realize annual energy cost savings of 20-30 percent compared to buildings without daylight design or controls. Electrical energy can be reduced as much as 70 percent during peak natural light periods. Assuming there are 260 working days per year, electricity costs are 10 cents per kilowatt hour (kwh), the daylighting system turns off the lights five hours per day, and the connected lighting load is 2 watts per square foot; this would hypothetically save around 25 cents per square foot of daylighted floor area. Many areas or buildings will have variables to this number due to a lower lighting load or lower electrical rates.

Next Month: "Celebrating the 6th year of Tech Talk"

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Establishing a Roof Inspection Plan

by Jeff Evans, RRC

Rare is the organization where roofing funds flow like water; almost every building owner we work with has the quandary of too many problem roofs for the money available. The problem may well be a lack of money, but it could also be lack of a coherent roof management plan.

Most maintenance and engineering managers of commercial and institutional facilities agree in theory, that regular inspections are an essential part of a roof asset management program. They would also recognize and agree with the basic roof management tenet that regular roof inspections and routine maintenance reduce ownership costs, reduce leak frequency and severity, extend roof life, and reduce management inefficiencies.

In practice, we have found that by the time many organizations think about starting a *roof management plan*, they are in need of a *roof replacement program*. The opportunities to maintain and repair have been supplanted by the obligation to fund and implement roof replacements.

If you can extend the life of each roof under management one year, you break even on the roof management plan costs. If you can extend each roof by two or three years, the plan can reduce roof expenditures a multiple of its costs.

Why in practice then, don't most organizations have a viable roof inspection and maintenance plan? Is it inertia, a "we've never done it that way before" mentality, a fear of the unknown? It's hard to fathom. What is certain, is that most plans never get started. Also certain, is that even a minimal plan is better than no plan. The best advice is to just get started!

Step One: Take Inventory

The temptation in beginning a roofing program is to jump right in and start filling pitch pans. This would be a definite improvement over no roof management effort at all, however, we suggest the best first step is to take an inventory of the roofs under your care. This inventory begins with developing a historical file for each roof that includes these bits of information about each roof:

- Date of installation
- Installing contractor
- System manufacturer
- Warranties
- Type of membrane, insulation and roof deck
- Leak history
- Repair history, dates, type and cost of repairs

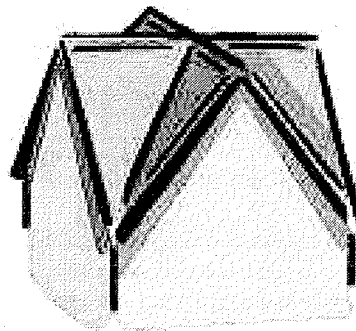
Step Two: Roof Assessment

With all your roof information in place, the next step is to get up on the roofs and perform a condition assessment. No roof can be appropriately managed without first knowing the roof's history and then understanding the current condition of the roof. Current roof condition is obtained by conducting roof inspections.

The person performing visual roof surveys should be very familiar with the design, installation, repair and types of failure specific to the roofing system being surveyed. Whether surveys are done by in-house staff or contracted to a consultant depends on the technical competence and

availability of your resources. In-house personnel who have had training in roof inspection, diagnosis, and repair can perform limited overview surveys.

The roof survey should include:



- Examination of roof membrane, flashings, sheet metal flashings, drains,

gutters, etc.

- Evaluation of observed conditions that may impact the long-term performance of the roof system.
- Documentation of deficiencies requiring corrective action.
- Development of long-range preventive maintenance needs.

Survey documentation should consist of a written report or checklist, photographs, and notes on a roof plan indicating the conditions observed. The roof plan should supply enough data to facilitate performance of the required repairs.

How often you need to perform the various tasks associated with a roof preventive maintenance program depends on the age and condition of the roof, environmental influences, rooftop traffic, occupancy sensitivity, size and roof accessibility. The following guidelines can help determine the frequency of the tasks:

(Continued on page 6)



President's Message

(Continued from page 2)

Circuit breaker GFCIs should also be checked monthly by pressing the "Test" button on the breaker, which should disconnect power to all lights and appliances on the circuit. Temporary or "plug-in" GFCIs are frequently used in construction and in outdoor settings with electric tools, mowers, trimmers, and similar devices. They should not be used as a permanent alternative to a regular GFCI. Temporary GFCIs should be tested prior to every use.

The trip button may activate when the test button is pushed, but the circuit may still be energized (connected). To be absolutely certain that your receptacle GFCIs are operating correctly, consumers should plug a nightlight or similar device into the outlet when conducting the following test:

1. Push the "Reset" button of the GFCI receptacle to prepare the unit for testing.
2. Plug in the light and turn it on. Light should be ON.
3. Push the "Test" button of the GFCI receptacle. Light should go OFF.
4. Push the "Reset" button again. Light should go ON.

A light plugged into the GFCI receptacle should go out when the test button is pushed. If the light remains on when the button is pushed, either the GFCI is not working properly or has not been correctly installed.

"You should not rely on a GFCI that fails this test," Biddle added. "A qualified electrician should inspect, possibly rewire, and, if necessary, replace the unit." Proper installation of GFCIs requires significant knowledge of electrical wiring and should only be performed by a qualified electrician. This type of receptacle should be considered as a back-up safety device, and not a replacement for common sense and prudent behavior whenever using electrical products. Wherever water and electricity are present, people need heightened awareness and should follow the safety instructions that came with the appliance.

There are three steps to be sure of your GFCI's reliability:

1. Use only GFCIs which have been listed or certified by a nationally recognized testing laboratory or certification organization.
2. Have your GFCIs installed by a qualified electrician.
3. Test your GFCIs at least once each month or whenever there is an unusual occurrence such as a severe electrical storm.

Source: The National Electrical Safety Foundation (NESF)

Following these simple steps could save your life or the life of one of your family members. ❖

Roofing Management

(Continued from page 5)

- Perform comprehensive visual roof surveys semi-annually.
- Conduct warranty surveys before the contractor or manufacturer's warranty expires.
- Perform housekeeping surveys on most roof areas monthly.
- Schedule corrective steps or repairs soon after the survey.

Step Three: Formulate a Plan

The information gathered does no good if it sits on a shelf accumulating dust. The data needs to be recorded and studied, as it will help identify the opportunities to make repairs, conduct maintenance or anticipate re-roofing.

Your plan will help you communicate better with upper management, your roofing contractor, and your maintenance staff.

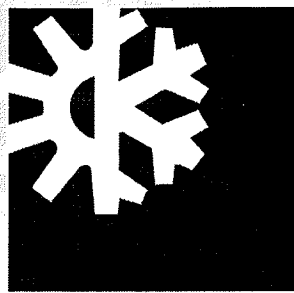
Don't be one of the facility managers whose roofs have to be replaced before their design lives are reached. Or for whom emergency repairs are needed at the least opportune time. Don't let your good roofs sit neglected, doomed to early failure.

The solution begins with a well-devised roof inspection and maintenance plan. So get started!

Jeff Evans is vice president of Benchmark Inc. (www.benchmark-inc.com), a provider of professional roof consulting services headquartered in Cedar Rapids, Iowa. He is a registered roof consultant (RRC) and has 23 years of experience in the roofing industry. Reprinted with permission. ❖

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SAABE TIMES May Issue

Final Thought:

After your hands become coated with grease, your nose will begin to itch.—Lorenz's Law of Mechanical Repair

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Membership Luncheon May 15, 2002

Time: 11:30 a.m.

Location: Old San Francisco Steakhouse
Program: Natural Gas Considerations for San Antonio, Presented by Patrick Kotara of City Public Service

**Upcoming Luncheon:
 June 19, 2002**

Sponsor: Ed Flume Building Specialties

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