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LODGING ENGINEER

THE ELECTRONIC MAGAZINE FOR HOTEL & LODGING ENGINEERS

The Inn at Virginia Tech
Blacksburg, Virginia

1ST PERSON INTERVIEW

Bill Fizer
Founder/Owner
Lodging Technology

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FEATURES

nahle

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LODGING ENGINEER™ reports about people, events, technology, public policy, practices, study and applications relating to hotel and motel engineering, maintenance, human communication and interaction in online environments. We are looking for authors. Do you have a story to tell? Contact NAHLE.

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As I See It

Robert Elliott, CCE
President/CEO NAHLE
Editor - *Lodging Engineer*

I am pleased to say that as a result of my recent summer travels I have become a Hokie or a parent of a student that is attending Virginia Polytechnic Institute and State University or as it is better known — VA Tech. This month's cover features the Inn at VA Tech where I stayed during student orientation. You can see how I was enamored by the beautiful stone and surrounding campus architecture referred to as neo-Gothic, though more descriptively called Collegiate Gothic. In fact, with any luck the property's management company, Benchmark Hospitality International, may allow me to interview their engineer for our magazine sometime down the road. It is a beautiful property and very well managed, so let's keep our fingers crossed. I am sure there is a lot of valuable information that can be shared here. I didn't even know about the mascot for VA Tech, the Hokie Bird, until my visit. Several parents were inquiring to the origin of the Hokie Bird. I, myself, could not find any reference to the bird in the taxonomy of biology. And once a Hokie, always a Hokie. VA Tech's motto is Ut Prosim, Latin for "That I May Serve." The VA Tech logo is "Invent the Future," which expresses the future-altering and future-enhancing work of each facet of the Virginia Tech experience. I hope that we can derive a lesson from the motto and logo. How can we serve? What can we learn from our experiences as hotel engineers? What can we learn from each other?

All right, I am digressing. I hope you enjoy our new hotel engineering Crossword Puzzle. Our CWP specifically for hotel engineers may be a first. I would like to take this opportunity to talk a little more about NAHLE. We now have over 100 engineers that have completed one of our certificate programs. We have another 50 or so candidates currently working on their certification. And, we are working with several hotel management companies and REITs anticipating several hundred more will complete their certifications over the next 18 months.

I recently had the pleasure of presenting to a group of hotel engineers at Destination Hotels & Resorts' annual Engineering, Finance and IT conference (ENFINITy) at La Cantera Resort & Spa in San Antonio. I want to say thanks to everyone for a great time! Mike Shutts, Vice-President of Corporate Engineering for Destination Hotels & Resorts, and Richard Manzolina, Director of Facilities and Loss Prevention, were tremendous hosts. And, I should mention that Destination has also been tremendous supporters over the years. Richard has another great article in this issue of ***Lodging Engineer*** and Mike provided a chapter for our Select Service (CCE) study guide.

I have been approached numerous times by vendors and engineers that would like to see NAHLE grow in two specific areas. One is to have our own trade show. The other is help forming local chapters. I am presently looking for hotel management companies to contact NAHLE and help us get a show together for 2015. We will probably have the first show here locally in the DC area. So, if you have any thoughts along attending or help planning, please reach out to me at 703-922-7105 or robert.elliott@nahle.org.

In closing, I would like to ask each of you to personally get involved. If you haven't already, sign up as a member. In fact, sign up today! We need your support to continue. And, if you would, please "click on an ad with your mouse" as you read our magazine. Better yet, consider contracting or purchasing with the vendors that support NAHLE and ***Lodging Engineer***. Our sponsors are literally counting how many people click on their ads and buy their products as a result of their involvement with NAHLE. And, if it is between a NAHLE supporter and a vendor that is not

a member or advertiser, it should be a no brainer. This is your association specifically for hotel engineers. Get involved and help us build NAHLE. We are looking for volunteers for an Advisory Committee that will assist in the leadership and development of NAHLE. So please contact us if you are interested. NAHLE has now completed five years of growth and development. As a result of our effort we have a state-of-the-art infrastructure in place which includes a website, an electronic quarterly magazine and weekly newsletter, a free job bank, and two educational programs for professional development and training.

I think I can sum up our immediate and future needs in two words: HELP WANTED.

We are currently looking for new members, contributing authors, leaders, and, most of all, your input.

Get involved…do it today!

Very truly yours,

Robert Elliott, CCE, CDOE, CLSD
Executive Director
National Association of Hotel & Lodging Engineers

From left to right: Shawn Bratcher, Shannon Deer, Richard Manzolina, Katie Osse, and Robert Elliott

1ST PERSON
an interview with Bill Fizer

Bill Fizer
Founder/Owner
Lodging Technology
http://www.lodgingtechnology.com
By NAHLE Staff

Lodging Engineer: *Bill, we are honored to have someone of your stature and importance grace the pages of Lodging Engineer as our 1st Person. I first learned about you and your company through some ads that you ran with us. I became fascinated with the technology and innovative energy savings your company, Lodging Technology, provides our industry. Our paths crossed again when a large REIT, which works with NAHLE/AHLEI to certify their property engineers, rolled out your products in several of their hotels. At the time of its inception in 1980, infrared sensor-based hotel energy management wasn't merely 'cutting-edge' technology with all its inherent risks, but it was what I refer to as 'bleeding edge' technology. Now, that original product has evolved into your company's flagship product boasting guestroom energy cost reductions of 35% to 45%, with typical paybacks in less than two years. I think I can speak for our readers when I say these numbers most certainly have our attention.*

LE: Bill, tell our readers a little about your company and its flagship product.

Lodging Technology's primary product is called GEM Link® Wireless. A basic GEM Link® system consists of three components: a Transceiver Control module connected to the a/c unit (the "brains"), a wireless Passive Infrared (PIR) Sensor, and a wireless entry door switch module. These sensors automatically reset the room temperature when guests leave the room to reduce energy consumption.

When a guest enters the room, the door switch module transmits "door open/door closed" to the Transceiver. As the guest continues into the room, the PIR Sensor detects his/her infrared body heat and transmits "occupancy detection" to the Transceiver. The Transceiver determines, "Hey... someone is in the room" and releases normal control of the a/c thermostat to the guest. Guests do what they have always done. They can select heat or cool and set the desired temperature. With the entry and balcony doors closed, GEM Link®

Wireless Sliding Door Switch Module

is "locked" into an "occupied" mode, requiring no further detection of guests until the entry door opens again.

LE: Can you tell me a little about how it all began?
I've always liked science, especially chemistry, electronics, and astronomy. In high school I conducted extra-curricular experiments and read a lot of technical magazines and articles.

LE: So how did this lead to a career in electronics and your first patent for hospitality products?
I started my electronics career by joining the US Army in 1961. I became an instructor of Fire Control & Pulse Acquisition Radar of the HAWK missile system at the Ordnance Guided Missile School (OGMS) in Huntsville, AL. I was later transferred to Okinawa teaching and doing field maintenance on the electronics that I taught on at OGMS. These were very formative years that taught me self-reliance and perseverance, and set the direction for the rest of my career.

LE: You mentioned that a couple of historical milestones helped in the evolution of your product's development:
In 1973 I joined Universal Communication Systems (UCS), the first national telephone interconnect company, as a design engineer. This was just a few years after the famous Carter-phone decision in which the FCC ruled that an individual or company could purchase their own phone system rather than continue to rent from the Bell operating companies.

LE: Didn't the oil embargo of the 1970's also impact the hospitality industry in ways our country had not experienced before?
Yes it did. The first Arab Oil Embargo occurred in the late 1970's and caused shortages in fuel, long lines for gas, hotel travel to decrease and energy costs to escalate. This had a devastating effect on the hospitality industry due to increased cost and decreased occupancy.

LE: I remember waiting in long lines for gas while attending WVU in 1970's. What happened next in the evolution of energy management?
One day back in 1979, Adolf Krisch, Chairman of American Motor Inns (AMI), came into my office, slammed his fist on my desk, and asked me to stop what I was doing and come to work directly for the President of Universal Communication Systems (UCS). My job was to find a way to reduce AMI's energy costs.

Long story short, after experimenting with several methods, I designed the first passive (PIR) infrared sensor-based hotel energy conservation systems in 1980. Infrared sensing of "body heat" was the new technology in 1980 for security / burglar alarm systems. I formed an alliance and personal friendship with Don Hume, owner and founder of Colorado Electro Optics (CEO), the developer of the first PIR security systems. I designed the first PIR energy system using CEO's technology. PIR sensors were very difficult to manufacture in 1980. We were the only PIR hotel energy system for ten years until PIR sensors became easier to manufacture in 1990.

"I started Lodging Technology out of my basement office."

LE: You started Lodging Technology around this time, didn't you?
When AMI and UCS were sold to Prime Motor Inns of Fairfield, NJ in the early 1980's, UCS released certain patents to me. I started Lodging Technology out of my basement office. I was the first, and the only for ten years (1980 – 1990), to

use infrared "body heat" detection of guests rather than motion. I am considered by many to be a "pioneer" in this industry (does that mean I'm old? ***LE: A thing of beauty is a joy forever…)*** Lodging Technology provides high quality, reliable systems to reduce HVAC energy consumption and costs.

LE: So you can boast that your company's products are truly American-made?
Yes, we design and manufacture our products in the United States utilizing a network of manufacturing partners and suppliers of more than 34 years. Even our plastic enclosures are molded in Virginia, not overseas.

LE: Tell me about your products. One of the biggest hurdles to new technology in the hospitality industry is compatibility with legacy systems. My understanding is that your product is backward compatible interfacing with any existing legacy HVAC system. Can you speak to this?
Sure, Lodging Technology's flagship product, GEM Link® Wireless, has a powerful feature set capable of connecting to and controlling any HVAC unit of any type (Fan Coil, PTAC, Heat Pump, Split System) of any age with any type thermostat. A basic GEM Link® system for a standard room consists of three components: a Transceiver Control module connected to the a/c unit (the "brains"), a wireless Passive Infrared (PIR) Sensor, and a wireless entry door switch module.

LE: Tell us about some of the product's features.
A GEM Link® Transceiver can be field programmed to be a Repeater to increase the wireless radio range, a Slave to another Transceiver for suites with multiple a/c units, and a lighting controller for conference rooms or school classrooms (or both as an a/c and lighting controller). It can also be exclusively "bound" so that the PIR Sensors in bedrooms of suites only control the a/c in the bedroom and not in the main living area. Additional Transceivers, PIR Sensors, and entry door or balcony door switches can be "bound" together and programmed for multiple room suites such as Homewood Suites, Embassy Suites, and large condo hotel suites. GEM Link® has been installed in 2600 square foot suites with four bedrooms, two a/c units, and seven balcony doors.

LE: Why is this product so beneficial?
GEM Link® reduces maintenance costs since the a/c units operate approximately 40% less, and prevents a/c coils from freeze-up since the units are setback while guests are out. The hand-held Room Status Scanner (RSS) allows housekeeping, mini-bar service, and maintenance personnel to determine actual physical room occupancy prior to knocking and disturbing guests. This prevents embarrassing intrusions while guests are sleeping, dressing, or showering. The security staff can also use the RSS to check, from the hallway, room occupancy compared to the rented rooms list. GEM Link® has also been installed to control guestroom electric water heaters, found in many condo hotels, and two burner stove cook tops found in many suite hotels. Insurance rates are often lowered because a guest cannot leave a cook top on while out of the room, but for a programmed time delay.

Air Conditioning Coils Exhibit Little to No Freeze-Up

LE: This sounds quite complicated. Is your product easy to install and use?

GEM Link® is powerful yet easy to install, program, and understand During installation, each room's GEM Link® components are "bound" together with a unique, random 16 digit address code and assigned the room number. (This is equivalent to binding your garage door opener to your door so that it only operates your door and not your neighbor's.) The system is then programmed, with a small hand-held Programmer Maintenance Module (PMM). In addition to the room number, other parameters are set such as the hotel's desired temperature for an unoccupied room and the time delay after guests have left before resetting the a/c temperature. It requires no routine maintenance other than changing the AAA Alkaline batteries every four to five years on a preventive maintenance schedule.

LE: Doesn't your product and its technology transfer to other types of commercial applications?

Though primarily designed for hotels and motels, GEM Link® is equally applicable to reduce consumption and expense in classrooms, dorms, condos, vacation homes, and military lodging facilities.

LE: Bill, you've certainly had a successful career, but I get the sense retirement is still only a ten letter word in your vocabulary. Any thoughts about what's next?

We have some products in development. For example, we are working on a combination digital thermostat and occupancy sensor. We are also developing a networked feature for remote access to any room in an equipped hotel from a computer to monitor and change various system parameters, such as temperature setback and time delays.

I'll be 72 in October this year. I enjoy my work immensely and I am in great health, so retirement is not in sight. Anyways, I don't know how to play golf.

Ceiling Wall Mount Sensor.

Cost Effective Guestroom HVAC & Lighting Controls

Lodging Technology, one of the most trusted names in Energy Management, has provided innovative energy management solutions for the lodging industry for more than 34 years. Lodging Technology approaches these solutions from a "hotel operations" point of view — therefore the company provides energy savings without compromising guest service.

■ **Save 35% - 45%**
GEM Link® Wireless reduces wasteful HVAC consumption 35%-45%, with a simple payback of one – two years. The quickest and most effective way to significantly reduce operating costs is through HVAC energy management. Air conditioning and heat typically consume 85% of guestroom energy. However, rooms are usually empty 65% of the day while the HVAC unit continues to run.

■ **Easy to install and program**
GEM Link® Wireless can be installed in retrofit or new construction applications in about 30 minutes per room.

■ **Versatile**

- GEM Link® Wireless connects to any HVAC unit of any voltage with any type thermostat, including PTACs, VTACs, Split System, and Fan Coil Units.


42" PTAC


VTAC


26" PTAC

- An optional wireless hand-held Room Status Scanner™ (RSS) allows housekeeping and maintenance personnel to determine actual room occupancy before knocking and disturbing guests, therefore, dramatically improving guest service.


Room Status Scanner (RSS)

- GEM Link® Wireless is programmable to reduce both HVAC and lighting expense.

- GEM Link® can also control and reduce consumption of other appliances such as electric water heaters and two-burner cooktops found in condo/ hotel suites.

■ **Product support for the life of the system**
Lodging Technology provides support for GEM Link® Wireless for the life of the system at *NO COST* to the hotel.

■ **Made in the USA**
Manufactured in the United States in Internationally Certified ISO 9001:2008 facilities for highest quality and reliability.

■ *Although primarily designed for hotel guestrooms, GEM Link® Wireless is equally applicable to school/college classrooms and dorms, multi-bedroom vacation homes, military lodging facilities, offices, and other areas which are physically unoccupied for long periods of time.*

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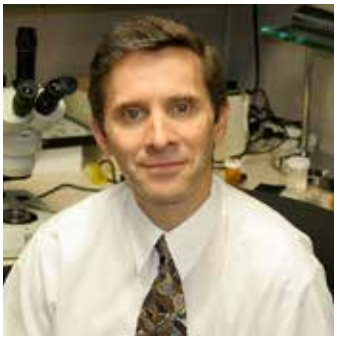
Integrated Pest Management: Encouraging Pests to Find Shelter Elsewhere This Summer



Ron Harrison, Ph.D.,
Director of Technical Services
Orkin, LLC

August has arrived, which means hoteliers around the country have geared up for the peak travel season of the year. Millions of Americans, not to mention countless travelers from all around the world, are booking transportation and lodging for their vacations, searching for a comfortable hotel where they can relax. And vacationers are not the only ones seeking out hotels for a break from the heat – pests are following suit.

When temperatures rise, pest activity increases as well. To manage pest activity on your property, it is imperative to establish a robust Integrated Pest Management (IPM) program. IPM goes above and beyond traditional pest management; instead of relying solely on chemicals to reactively repel or kill pests, IPM focuses on non-chemical techniques such as exclusion, sanitation and facility maintenance to help keep pests away proactively. An effective IPM plan also requires a higher standard of scientific expertise, including knowledge of pest biology, pest behavior and best practices in pest control technology. This knowledge helps to better understand why pests do what they do and in turn better prevent them.

To ensure your IPM plan is as strong as possible, be certain it includes the following:

- **Pest Management Partner:** Your relationship with your pest management provider should surpass typical vendor status. Your pest management provider should be a partner who takes the time to design an IPM program especially for your property, adjusting the plan over time as pest pressure and your pest control needs evolve.
- **Staff Empowerment:** Work with your pest management provider to host an IPM training for your staff, as they are your eyes and ears and are often the first to see pest problems around the property. By hosting an IPM training, your staff will gain an understanding of your IPM program and their role in preventing and controlling pest activity at your hotel.
- **Non-Chemical Prevention:** Exclusion and facility maintenance should play major roles in your IPM program to help prevent pests from entering the building. Common techniques include sealing all cracks and crevices with weather-resistant caulking, closing any holes on exterior walls, adding weather stripping around windows and installing door sweeps to limit gaps under doors. You may also consider mounting air curtains and working with an HVAC professional to ensure there is positive airflow at doors that pushes pests away from entrances.

- **Sanitation Regimen:** Sanitation is an important component of IPM that helps manage pest activity. Work with your pest management provider to establish a stringent sanitation regimen that covers indoor and outdoor areas. Inside, keep food covered in continental breakfast buffet areas and otherwise stored in airtight containers. Clean spills and crumbs immediately. Outdoors, inspect the grounds and parking lots frequently to look for trash or standing water that can attract pests. Consider using an organic cleaner to break down the malodor molecules that create pest-attracting odors in your dumpster, which should also be placed as far away from the building as possible.

- **Chemicals as a last resort:** While IPM focuses on proactive prevention instead of reactive chemical use, some pest issues may require targeted use of chemicals. Your IPM partner should only use chemicals when all other proactive, non-chemical-based methods have been exhausted. After the targeted treatment, your partner should follow up with non-chemical methods and monitor the program for effectiveness.

Now that you have a basic understanding of IPM, here are more specific tips regarding two common summer pests: ants and mosquitoes.

Ants are often considered the most annoying pests because they can pose health risks and cause structural damage. Their tendency to colonize in high populations also makes them incredibly difficult to manage. If you have an active ant infestation, work with your pest management provider to identify the species of ant on your property. Correct identification of the ant is vital, as the treatment program is fully dependent on the species. However, you shouldn't wait until you see ant activity to manage the situation – there are plenty of ways you can proactively prevent ants from coming in your buildings, including:

- Trimming vegetation and tree branches and removing any dead or diseased plants or limbs to create an 18-inch buffer around your building's perimeter.

- Inspecting door sweeps, weather stripping and window screens to ensure they are in good condition throughout the hotel.

- Sealing all cracks and crevices on exterior walls of your hotel to prevent ants from slipping in unnoticed.

- Cleaning all food and drink spills as soon as possible both indoors and outdoors as the debris and residues are an attractant to ants and other pests.

Mosquitoes are not only annoying; they pose serious health threats to your guests. Mosquito bites can be dangerous because they are capable of transmitting West Nile virus, Dengue fever and the recently discovered Chikungunya virus, along with other conditions that cause encephalitis, or swelling of the brain. According to the Centers for Disease Control and Prevention, in 2013, more than 2,300 cases of West Nile virus were reported in 48 states.

Ways to help protect your guests from mosquitoes include:

- Removing any sources of standing water, such as gutters, birdbaths and plant pots– mosquitoes only need 2 to 3 inches of water to breed.
- Inspecting window screens to ensure they fit tightly and have no holes.
- Installing automatic doors at entrances to your hotel, and using double doors at the busiest entryways.
- Treating breeding sites (and sometimes vegetation) around the property. This can significantly reduce mosquito populations.

By establishing a robust IPM plan and following these tips to proactively prevent ants and mosquitoes or, you will help ensure your hotel is ready to give a warm welcome to visitors this summer – and show the door to pesky pests.

Ron Harrison, Entomologist, Ph.D., is Director of Technical Services for Orkin and an acknowledged leader in the field of pest management. Contact Dr. Harrison at rharriso@orkin.com or visit www.orkin-commercial.com for more information.

Maintenance Tip:

Bed Bugs are the bane of the hospitality industry's existence. These transient pests can make their way room to room on your guests' luggage, their clothes and even their bodies all year long. Miss just one female bed bug and your hotel can become infested with more than 300 adults and 1,000 eggs in just three months. These pests will not only irritate your guests, but will quickly tarnish your hard-earned reputation. Here are a few tips for spotting activity:

- Bed bugs are nocturnal and difficult to spot during daytime hours. Inform your staff to be on the lookout for tiny ink-like stains or molting skins on mattress tags and seams, between or beneath furniture cushions and behind headboards during their daily routines.

If you spot a bed bug or signs of activity, your pest management provider may advise you to take the following steps:

- Move loose furniture like desks and chairs into the center of the room and turn them over.
- Keep the conditions of the room the same as when signs were spotted – do not adjust the temperature or attempt to clean the room.

- Remove any items from the walls and place in the center of the room.

Lastly, your pest management provider may recommend a few different service options to clear the area of bed bugs. This may include vacuuming, heat treatments and/or targeted residual treatments. To ensure the bed bugs haven't traveled to adjoining rooms, your pest management provider may recommend DNA testing or a canine inspection to determine if the infestation has moved outside of the initial room.

Here's what recent graduates are saying about our Certified Chief Engineering (CCE) and Certified Director of Engineering (CDOE) programs:

"I think that the course benefits every Chief Engineer that takes it and also the company. It helps do the work more organized and it helps understand the functions of each system you work with.

"The information was presented good and was easy to understand. The online tracking was easy to get to and follow along with. The program overall was very good. In my opinion the course was very informative because it covered very important themes focused on the system or the equipment we work with everyday at the hotel. Everything was explained with basic examples and simple words."

"I think the program is great. It definitely was a reinforcement in some areas that I was familiar with and a great learning experience in others I didn't have much knowledge. Very straight forward, seems to me that whoever put this course together must have been in the field."

Robert Bell, CDOE, Chief Engineer, at Marriott Renaissance Plantation Hotel in Plantation, Florida was the first designee as Certified Director of Engineering. When we started with only the full service program we used Certified Chief Engineer. We have now, after a year and a half of development completed a second certificate program for select service property engineers.

"I've been an engineering manager for over 14 years, 10 in limited serve and the last 4 in full serve at the Renaissance Plantation. For a while I've been searching for a certification designed specifically to enhance my knowledge and competency in hotel engineering. My supervisor recommended the CCE certification from NAHLE and I must tell you this course hits all areas and key points from what you need to know to keep your facility maintained and running efficiently to being compliant with most city, state and federal codes and regulations. It's an all around great self study course for the hotel Chief Engineer and DOE, and to this day I keep my study guide on my shelf as a reference if ever needed. I am also honored to be the first person to be designated CDOE from NAHLE and a proud member."

ELECTRIC MOTORS IN HOTELS: PART ONE

William Blackmon, CDOE

WilliamBlackmon@tech-center.com

It is difficult to imagine our modern world had it not been for the development of the electric motor. In every aspect of life, we have a dependency on electric motors. From our HVAC systems, to our municipal water supply, from refrigeration for safe food storage and handling, to vertical transportation systems, electric motors provide the power so critical for the world we live in today.

If you take a minute and really consider the number of motors at work at even a small hotel property, it soon becomes obvious how reliable motors are. That reliability can create an unrecognized risk for the engineering department. Since motors perform so well, engineers seldom need to troubleshoot, repair, or diagnose issues involving them. Many times this limits the development of in depth experience and technical knowledge. When problems arise, it can be a difficult challenge to determine the issue or source, owing to this limited experience.

With that in mind, this series of articles has been written to help you gain a better understanding of motors and motor controls. Through this series, we will work to bridge the gaps that often cause confusion and lead to misdiagnosis of issues. We will cover the basic theory that you need to know to help you understand how motors operate. We will look at several different types of electric motors, focusing mainly on the most common types you will encounter at your property. We will also discuss the components that comprise the controls, and specific issues that can develop with them. Then, we will turn our focus to troubleshooting motors, controls, and even load related issues. We will conclude the series with an emphasis in two of the most critical areas. First, how you can develop and implement a maintenance program for your motors and controls. Second, how you can best continue your technical training and development.

Manual 2 — Pole Switch With Overload Protection

The intent of these articles is to elevate the technical understanding of experienced engineers. It targets only those who are qualified and trained to

work on or about electrically driven or controlled equipment. It is not a training program for the inexperienced, nor is it intended to be. Safety must always be observed. Never work on any system or component unless you are qualified, trained, and authorized to do so. Always wear the proper PPE. Always refer to the manufacturers written instructions. Always adhere to applicable local, state, and federal laws concerning safety in the workplace. See *www.nahle.org for OSHA Lockout/Tagout compliance guide.* It is imperative to always be aware your work can or will expose yourself and others to hazards and dangers. Take the appropriate steps necessary to safeguard yourself and others from these hazards. If the work can not be completed safely, do not start. Remember, it is the responsibility of the engineer to keep himself or herself safe, as well as anyone else who might be exposed to a hazardous condition.

It is important to understand that electric motors are not stand alone pieces of equipment. They are one part of a complete system. They obviously need a power source, as well as some manner of control. This might be simply a manual switch and a power cord, or it could be a magnetic motor starter powered from a 3 phase source. Motors will also be connected to some form of a load. A load might simply be a fan blade assembly, or maybe a centrifugal pump, or even a compressor. No matter what types of source, control, motor, and loads you have, it is imperative to realize that they are all part of this complete system. Issues with one part can affect another part, or even every part, of the system. Many motors have been incorrectly replaced because the engineer did not troubleshoot the entire system, only one part.

Let us take a general look at the complete system. We will go into greater detail later. We can group all the components into three main parts, the control, the motor, and the driven load. The control will generally provide the connection to a source of power for the motor. It will also provide the means that starts and stops the motor. It may also provide overcurrent and overload protection, dependent on the size and design. Each control is somewhat unique, based on the location it will be installed in, the size of the motor, the voltage of the motor, whether it can be started remotely, and several other factors.

The motor is, for the most part, one complete assembly in a sealed housing. There are two bearings inside that support each end of the motor shaft. These bearing may or may not require grease and therefore may not have grease fittings on the exterior of the motor housing. The shaft will protrude from one or both ends. Most motors will have a small fan blade and cover mounted over on end to cool the motor, while the other end extends for the connection of the driven load. A nameplate is almost always included on a motor. It will be mounted on the exterior side of the motor housing and can be as simple as a paper label. Most of the time, it is a metal

Phase Motor With Cast Iron Housing

tag riveted to the side. It is a crucial component providing all the information about the motor. It is critical never to remove or damage a motor nameplate. We highly recommend documenting the nameplate data from every motor at your property, preferably when installed new. A clear, digital photograph of each nameplate stored electronically is the best method and invaluable for future reference. (***NAHLE members can use our website to archive all of their digital files and photos with an easy to file system***.)

We have hopefully sparked some thought with this first article. It is important to always look at motors as a complete system. That system is made up of many parts, all interdependent on each other. Failures in one will affect, or even cause, failures in other parts of the system."

In the next article, we will focus on the basic theory that will answer many of the questions you may have regarding motors. We will cover the different types of motors you will find at your property and explain how they operate. By learning the theory and methodology, you will rapidly gain a full understanding of motor driven systems. By the conclusion of the series, you will have a sound basis that will help you to identify the vast majority of issues and failures and how to best prevent them in the future. By eliminating service disruptions and controlling repair costs, you exemplify the value a certified engineer can add to your property.

"Complacent reliability can create an unrecognized risk for your hotel's engineering department."

The load is the final part of the system. It is connected either directly or indirectly to the motor shaft. It might be a simple fan blade mounted to the shaft of the motor. It might also be some form of a pump connected via a coupling to the motor. It could be a gear box, or even a blower indirectly driven by belts by way of a sheave mounted to the motor shaft. No matter how it is connected, it is the final part and the whole purpose of the system.

About the author: *William Blackmon is a NAHLE Certified Director of Engineering and a licensed master electrician. He is dedicated to advancing the field of maintenance and places a key focus on technical skills development for his teams, as well as himself. You can contact him by email at WilliamBlackmon@tech-center.com.*

"MAINTENANCE TIP"

Courtesy of W.W. Grainger, Inc.

What's in a name (plate)?

If you wish to purchase a replacement, check the motor nameplate for the manufacturer's specifications. Located on the motor istelf, it contains important information, including: Voltage, Horsepower, Phase, Frame Size and RPM.

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Richard E. Manzolina, CEOE
Director of Facilities & Loss Prevention
Lansdowne Resort
44050 Woodridge Parkway Lansdowne, VA 20176

After a quarter century in this business, I've inherited more than a few distressed operations. And I've learned it's not just buildings that have quirks, but also the people who run them. Everywhere I have worked, I've managed scores of incredibly unique and motivated men and women. My experience in management has allowed me to pick up a few tricks of the trade, techniques that seem to hit the mark time and time again.

LEARNING…THE HARD WAY

Admittedly, most of my techniques stem from previous failures. Managerial blunders (that seemed so right at the time) have hence proven their worth solely as shining examples of how not to manage people.

Take for example my stint at what is arguably the most famous hotel in the world. (I won't mention names but it rhymes with Peoria!) After just a few weeks on the job, I was assigned to deep dive the chronic absenteeism of some of my senior staff members. Armed with all the self-righteousness my newly gained position could bear, I quickly determined my number one offender was a painter named Bill. Bill's attendance was as spotty as a firehouse Dalmatian. In fact, we had yet to even meet, but I wasn't about to let that slow me down. I quickly pulled his file and called him at home to start my investigation. But Bill wasn't there. Instead I spoke with Mrs. Bill, who was completely unaware of her husband's work absence. So far as she knew, Bill was at work every day. She wasn't happy, and nor was Bill as I would soon learn.

Fast forward to the next day. I finally had my chance to meet Bill, albeit it was under extreme duress. He stormed into my office, demanding to know who the hell I thought I was and how I had the gall to call *his* house and check up on *him*. Yelling ensued and the situation quickly escalated as we both dug our heels in. "Wait a minute," I thought. Where was the instant subordination and respect for authority I had read about in my textbooks? After a few more minutes of shouting I had an epiphany… the best thing to do was fall on my sword. If was going to get anywhere with Bill, I need to switch gears, and fast. And that's exactly what I did. I took a big bite of humble pie and exercised some humility. "You know what Bill," I said, "you're right. I never should have called your house, at least not before talking to you in person first. I apologize for jumping the gun and it won't happen again." Then I extended my hand to him, and looked him straight in the eye so he knew I meant it. He calmed down almost immediately, and to this day I remember the incredible wave of relief I felt at that moment. Did I mention Bill was built like Shaquille O'Neil?

IT'S TIME TO CLEAN HOUSE . . . BUT ONLY LITERALLY

Seemingly every hotel I have worked in comes

with decades of junk built up to absurd levels. Mountains of ten year old work tickets. Bathroom hardware from three renovations ago. Foil wall paper from, well, from when foil wall paper was *in style*. The clutter becomes a choke point, if not an outright hazard. And it's got to go. Easier said than done, but you have to get organized to build a foundation for success. Rent a dumpster and start dumping. Put all the scrap metal in one of your guys' pick-up trucks, then take it to a scrap dealer and use the money to buy pizza for everybody.

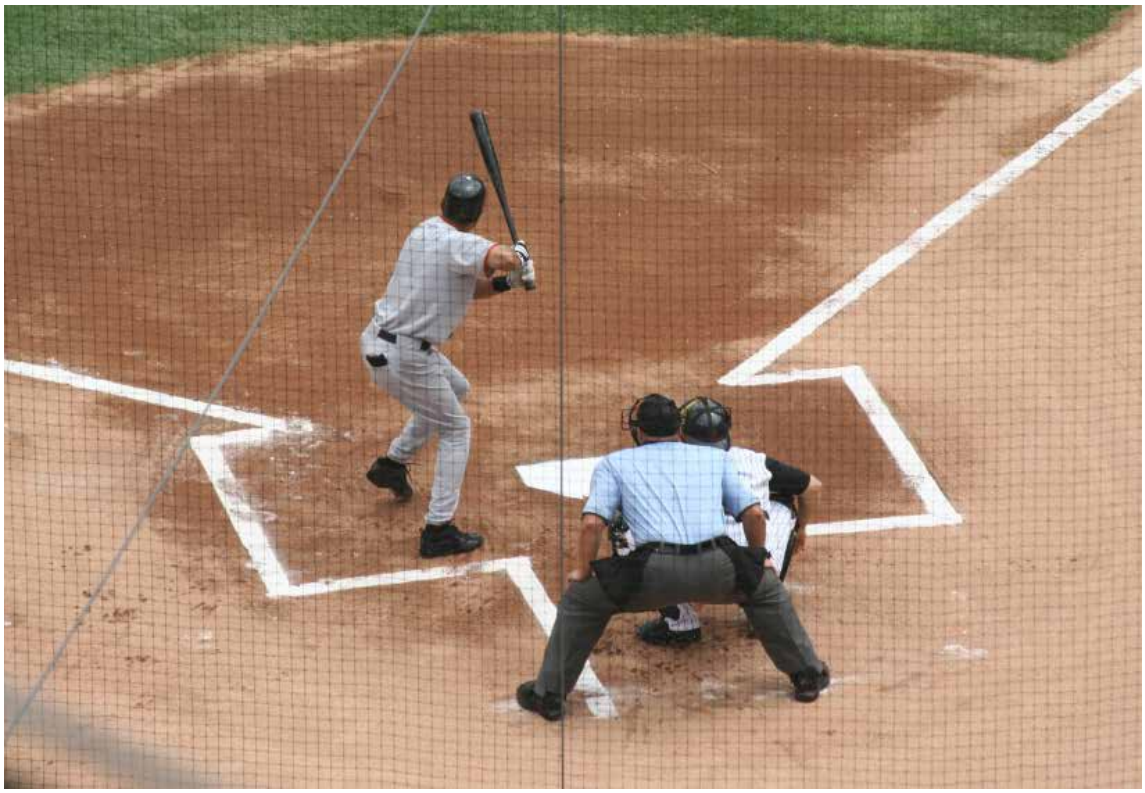
Once you've cleared the land, it's time to dig the foundation. Paint everything, and I do mean everything. Not just the walls and floor but even the ceiling. Yes, that ceiling. The one filled with conduit, duct work, fire proofing and pipes. Blow all the years a dust off with a compressed air gun and then start spraying it all white…yes white. You'll be amazed how much lighter and brighter your old dingy shop will look when the light from your fixtures gets *reflected* instead of *absorbed* by the walls and ceilings around you.

Lastly, take the time to organize your stock and repair parts. Have your staff tell you what's needed to keep on hand, then get it. And create clean, organized bin systems for it all, with printed min/max labels so you don't run out of stuff. Better yet, don't do any of this… delegate it.

It's not done until it's done-done

Once you've mobilized the fleet, take a look at what your troop's battle armor. Are they trying to fix everything with a 6-in-1 screwdriver and a pair of channel locks? Are they trying to troubleshoot circuits with nothing but a receptacle tester? Too often, maintenance teams are expected to work miracles with little more than a roll of duct tape and a plunger, only to have their reputations get continually marred when their temporary repairs don't last. The old saying runs true if you let it…there's never enough time to do it the right way but always enough time to do it again. It's no way to run a department.

Instead, this is the perfect time to make an investment in your team. Go ahead and buy them a good multi-meter, and have the factory rep come out and demo it for them. Break down and get the aluminum pipe wrench…the cast iron ones weigh a ton! And take a look at their uniforms too. Nothing says I'm in it for the long haul then taking the time to help your staff look the part. But hand over all these goodies with an asterisk. From now on,



things get done-done. That means to do whatever needs to be done to ensure the repair is done right. Not just okay for now, but put to bed for good. Make it done- done! In fact, that's my team's motto… *The ones who get it done-done!*

I FIX NOTHING

In practice, I've found the first two steps take about six months to a year, depending on how entrenched the old habits are. That's when the real work begins.

you should consider promoting to customer.

EMBRACE FAILURE

Now that you have a group of well-armed engineers eager to jump into the trenches, it's time to set them loose. But resist the temptation to give them direct orders. Instead, give them the mission. If you're lucky, they'll fall flat on their face, and that's when all of this rapport building will have been worth it.

"I have no problem with whatever decision you make, so long as you make one and do so for what you believe is the betterment of the hotel."

Until this point there's been no mention of looking closely at your staff members, especially at their aptitude. This is not an error of omission but rather a critical part of a calculated plan. Anyone can come in, clean house, and start all over with new people…but that's being short sighted. The real trick is effecting change in the existing staff; turning a flock of turkeys into a soaring group of eagles.

First step in accomplishing this goal is accepting one simple fact…you fix nothing. In truth, we as leaders fix very little. Instead, we *manage* those who do the fixing. In this vein, our jobs are not to fix but to facilitate. My job is to give my team what they need to do their jobs, whether it be tools, equipment, training, standards, a pat on the back or a kick in the ass…whatever they need to succeed it is my responsibility to provide. Their responsibility, in turn, is to execute…to get it done-done.

I am motivating not though direct pressure to succeed, but instead through the removal of obstacles so that my team may naturally flourish. Those who can and want to – will. And those who don't will no longer have a mountain of excuses to blame for their lack of success…shining a glaring light on the team members worth investing in, and those who

Think about it. No matter how much you try, you can never possibly script the perfect response to every conceivable circumstance your staff will face. You'll be much better served to focus on helping them use their judgment to make the best decision they can when the situation arises. And most importantly, back them up, especially when they fail. I always tell my staff "when you hit a road block, I have no problem with whatever decision you make, so long as you **make one** and do so for what you believe is the betterment of the hotel. Do nothing but throw up your hands and pass it along to the next guy…that's when we have a problem. You have to make a decision. If you were right, great… and if you were wrong, I'll take you aside and show you what to do differently next time. I'll still back up every move you make along the way." In this way, we build the lieutenants, not the infantry. Your staff will become part of the solution…problem *finders* as much as problem solvers. Before long, you will have created a clear sighted, well-motivated team that's worried less about CYA and more about the satisfaction of your guests, the good of your facilities, and the brightness of their futures.

Increasing Hotel Energy Savings and Guest Comfort with Air Curtains

by Stephen Benes
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Air curtains have evolved from just a shipping door necessity to a vital strategy for keeping hotel entrances more energy efficient, free of flying insects and more comfortable for occupants.

Sometimes referred to as air doors, air curtains have expanded to the front door, side doors and even foodservice walk-in cooler doors to reduce energy costs. The energy saved with an air curtain, in most cases, results in paybacks of less than two years and can be estimated with an energy analysis by an air curtain manufacturer.

Energy savings is typically the main impetus, however sanitation is important as well. Flying insects can not fly through the air stream. Thus, flies are kept to a minimum not only in shipping and foodservice areas, but also hotel lobbies. Furthermore, minimizing flying insect pests without the use of chemicals can cut maintenance department material and labor costs. California and Florida's health code requires air curtains on any foodservice operation's shipping or backend pedestrian door. Other states are expected to follow suit, however certain jurisdictions in Alabama and Texas are already mandating air curtains.

Besides sanitation and energy savings, air curtains can also enhance customer and employee comfort. For example, air comfort was the reason Pete LaPage, director of engineering and sustainability, Sheraton Hotels & Resorts, Syracuse, N.Y. installed a third lobby area air curtain last year to accompany two others installed in 2001. The four-foot-long, ceiling hung air curtains prevent blasts of hot or cold air through the front doors that potentially affect the air comfort of front desk employees and bellmen, as well as lobby guests. In wintertime operation, the air curtains' on-board thermostatically-controlled electric heaters help maintain lobby temperatures near the doors during busy door-opening periods.

LaPage recommends air curtains with adjustable multiple speeds to prevent too strong an airflow on guests passing through the doorway. The two original three-speed air curtains are set for medium velocity, while the new 10-speed unit is set at the fourth level velocity.

Two air curtain installations spanning a 10 (h) x 20 (w) overhead door enables the Verona, N.Y.-based Turning Stone Resort and Casino's Lava Dance Club to keep the doorway open nearly year-round. The air curtains allow patrons to walk unobstructed into an adjacent courtyard while preventing mosquitoes, moths or outdoor ambient air from infiltrating the club. Essentially, the open doorway expands the club's space an extra 5,000 square feet for less than $5,000 worth of air curtain equipment.

How Air Curtains Work

Simply, an air curtain is a metal box with blowers, motors and an air discharge nozzle with directional louvers. What's not simple is the effectiveness of the technology. Air curtain technology draws interior air from the facility and discharges it through field-adjustable (+/- 20-degree) linear nozzles that "seal" the doorway with a non-turbulent air stream that meets the floor approximately at the threshold of the door opening. A properly-sized air curtain can contain approximately 70 to 80-percent of that air and return it to the space. Because an air curtain discharges air at velocities generally in the range from 1,000 to 3,000 ft/min., it separates the indoor from the outdoor environment and effectively prevents outside air, airborne dust and flying insect infiltration. The air curtains are typically activated by a limit switch or a smart control that can be programmed for a variety of opening and closing functions, as well as supplemental spot heating from optional on-board electric, steam or hot water coils.

Air curtains don't require much maintenance other than changing an air filter periodically and assuring the air flow is sufficient around the perimeter of the doorway and directed properly at the threshold.

The main difference between air curtains are manufacturers' specification claims and the actual performance statistics. For example, an engineer might specify a particular discharge cfm, but an overstated specification in a manufacturer's catalog, which is not uncommon, might result in poor performance and ultimately lost energy saving potential. Volume, velocity and uniformity of the air stream are critical factors in an air curtain's effectiveness, therefore it's important that air curtains perform up to manufacturers' specifications. A good place to review specifications is the Air Movement & Control Association (AMCA-International), Arlington Heights, Ill., which is a not-for-profit organization that tests and certifies fans, blowers, air curtains and other air movement devices; created a test standard to assess air curtains; and certify their performances. Thus, AMCA Standard 220, "Laboratory Methods of Testing Air Curtain Units for Aerodynamic Performance Rating" is now a test standard that's an American National Standards Institute (ANSI) and ISO standard.

Aesthetic In-Ceiling Mount Designs Drive Front Door Trends

The trend toward pedestrian doors is a direct result of increasing energy costs and the air curtain industry's move toward more aesthetic models that either match aluminum doorway frames or recess inconspicuously into ceilings with flush-mount designs.

In-Ceiling Mount Design

For example, the in-ceiling mount designs, which can be installed in both suspended T-bar and finished ceiling applications, feature flush-mounted aluminum facings and decorative grilles that can be powder-coated to match nearly any interior furnishing color.

Some in-ceiling mount air curtains can accommodate doorways that have ceilings as high as 16 feet. Widths range from three feet for pedestrian doors to 12-feet for multiple doors.

The technology of in-ceiling mount air curtains has advanced recently as well as aesthetics. State-of-the-art models draw room air, versus older methods of drawing potentially contaminated air from inside the ceiling.

Walk-In Cooler Air Curtains

Walk-in cooler doors, common to all hotel food-service operations, also waste energy when opened dozens of times daily, according to the Energy Policy and Conservation Act (EPCA) (Section 312) compliance. The code now mandates the energy-conserving, air infiltration reduction methods of either strip curtains, spring-hinged swinging vinyl doors or other options, such as air curtains, for all walk-in coolers manufactured after Jan. 1, 2009.

Air curtains may be the most efficient of the walk-in cooler door options, according to an Arby's franchisee Donoghue & Pivirotto Enterprises Inc., Wexford, Pa., which operates four Arby's stores. The franchisee performed its own two-week audited test on a 10 x 12-foot walk-in cooler at its 3,300-square-foot Arby's in Butler, Pa. After outfitting the walk-in cooler entrance with an air curtain, the results showed the refrigeration circuit's compressor ran 1.75-hours less during one week--a 27-percent reduction in compressor run-time and equipment wear-and-tear. The improvement resulted in nearly 100 fewer operating hours per year for an estimated annual savings of $447 and a 1.6-year payback on a walk-in cooler entrance air curtain.

A Vestibule Substitute

Air curtains have proven energy efficiency superiority over vestibules, according to the energy study "Air Curtains: A Proven Alternative to Vestibule Design" verified by second-party research/validation consultant, Blue Ridge Numerics, Charlottesville, Va. The study used computational fluid dynamics (CFD) analysis technology to prove that an air curtain/automatic door combination is 60-percent more effective in environmental separation performance than conventional automatic two-door vestibules.

Furthermore, vestibules cost up to 75-percent more in labor/materials than air curtains, and they also consume more valuable floor space, which in today's construction environment can carry costs between $100 to $250 per square-foot. Vestibules theoretically conserve energy because as one door opens, another closes and prevents a breezeway where heated and cooled air escapes or outdoor environmental elements can infiltrate. Unfortunately, multiple people in the vestibule can defeat the strategy because both doors create a wind tunnel into the facility when open simultaneously.

The International Green Construction Code (IGCC) now provides an approved overlay of green construction products, such as air curtains, to the base code International Energy Conservation Code (IECC). Whether a hotel is allowed this provision is also often dependent on the interpretation of the code by local code inspectors or jurisdictional decisions.

Hotel facility operators are continually looking for methods of cutting operational costs. The air curtain is an option with a very short payback of two years or less, in most cases, for reducing energy.

The Turning Stone Resort & Casino's Lava Dance Club in Verona, N.Y., virtually added 5,000 square feet of space for less than $5,000 by installing air curtains and creating a year-round, unobstructed passageway from the club into an adjacent aesthetic outdoor courtyard.

Previously, the picturesque courtyard that borders the 22,000-square-foot, two-story night-club was uninvitingly obstructed by a 10 (h) x 20 (w)-foot automatic overhead door that was closed 90 percent of the year due to wind, cold or hot temperatures, energy losses, and flying insects such as moths and mosquitoes. Now air curtains disperse a uniform curtain of air that's easily walked through by patrons, but resistant to outdoor environmental forces.

Before — Courtyard with Overhead

"The doorway is unnoticeable when open and I get comments all the time that people walk toward what they think is another room and suddenly they're outside," said Jerry Marrello, operations manager.

The two custom air curtains employ two 12 x 144-inch hot water coils supplied by the building's natural gas-fired, domestic hot water loop. The air curtains provide thermostatically-controlled supplementary heat regardless of whether the door is open or closed. The customization also includes a variable frequency drive (VFD) that allows a multitude of fan speeds from the six ½-hp. motors. "It gives us flexibility to tune the air velocity so it's effective, but also not disturbing to the patrons," said Mike Vaccaro, director of facilities

After — Courtyard with Air Curtain

PROPERTY UPGRADES AND CONVERSIONS: WHAT TO EXPECT

By Manny Mercado, CDOE

I would like to talk about what we all experience when such projects take place. As many of you already know, Hyatt Place and Hyatt Summerfield Suites are getting conversions to the new Hyatt House. This will be my second upgrade or conversion. These two experiences have been challenging at first, but a big relief when it is all said and done.

Let's go back in time to my first property, the Holiday Inn in Monroe, NJ in 2004. When I took over that property, the property owners and an IHG representative were in the final stages of reflagging requirements to the Crowne Plaza name. The first phase was the first floor and meeting space, as you all know the Crowne is "the place to meet." Working with the site foreman has its challenges on any project. The crew will take your project to the next level, but you may find yourself working without them because of omissions in their contracts. For example, they ripped up telephone and network wiring in the meeting space and front desk. After pointing fingers at each other for making the mistake, I found myself rewiring all the meeting rooms and front desk because someone forgot to mention it in their contract. Yes, toning every wire was not a fun job; let me tell you.

The second phase was gutting out the guest rooms two years later with a different contractor. After completion, I got a few complaints of leaks on the first floor. Get this, the crew decided to use a sledgehammer to break the toilet bowls, which were full of water. These projects take a toll on you, if you are not well relaxed. I personally recommend yoga for all of you during the project schedule. Keep this in mind as you progress forward with the completion of a set of rooms: get in there and make a punch list. Stay on top of it with your corporate office and the foreman, NO ONE LEAVES UNTIL IT IS FIXED. Once the crew leaves, guess what? You are stuck with the job. This did not work out well for me at the Crowne Plaza. I got stuck doing the work because someone felt that the property could handle the miscellaneous repairs in-house. But I kept calm, took a deep breath and completed the job.

I am now in another transition, the complete conversion to Hyatt House. One might think history repeats itself, I for one can say that is true. I have six buildings on a garden style property. The construction crew takes one building out at a time. When one is complete, they take another out of commission and make the completed one ready for guests. Yes, I make a punch list and yes, I go directly to the foreman for instant

repairs. Sometimes these instant repairs don't get done. Why, because they are given a new direction by someone else, or they point the finger to subcontractors. So I take yoga classes once again. With my experiences I must say, I can write a book with endless thoughts of what construction crews are all about. Sometimes you just want to go to your office, shut off the lights and hide. I am staying strong because I was told that once all the buildings are complete, the crew will do a refresh of all rooms that will include my punch list. If you are reading this I am taking bets on it, because I am yet to be convinced.

I hope many of you out there who are yet to experience such projects, take a step to keep ahead. Do an inventory of what you have in place now, because once they get in there and things start to disappear they will say it was never there to begin with. I will give you one example; for some odd reason the 1st building's fire maps behind the door were never there according to my contractor. That's because when I walked around I found them thrown on the ground and in the trash. Well, they were there before.

Some of you may wonder how these renovation projects come into play. I will explain. The process starts off at the corporate office with the brand representative. Once the office and the brand are in agreement with the changes it goes to the design team. After all designs have been approved by the brand and deadline dates set, the project goes out for bid. Once a contractor is selected, drawings and permits have to be submitted for the construction site. Once approved by the local township office, our friends arrive to coordinate their plan of action to the site management team. This is where you sit in and get to know who they are and who you complain to on-site. Once we shake hands and have a start date, you register with the nearest yoga class and you are set. The end result of these projects is the feeling of a new start, having a new product and a new image. With our Hyatt House, the new rooms and new name gave us a fresh outlook on a new venture.

"For some odd reason the 1st building's fire maps behind the door were never there according to my contractor."




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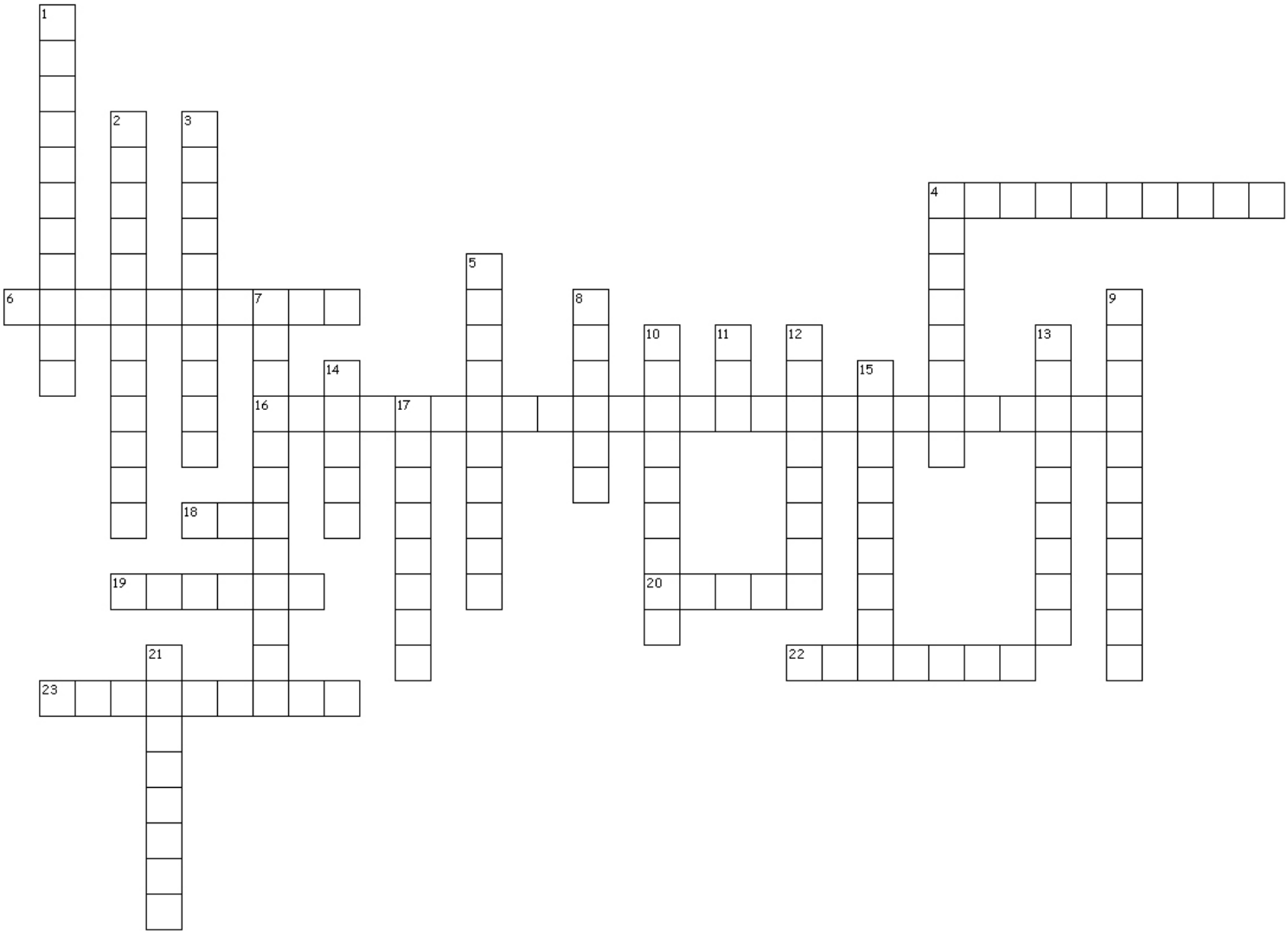
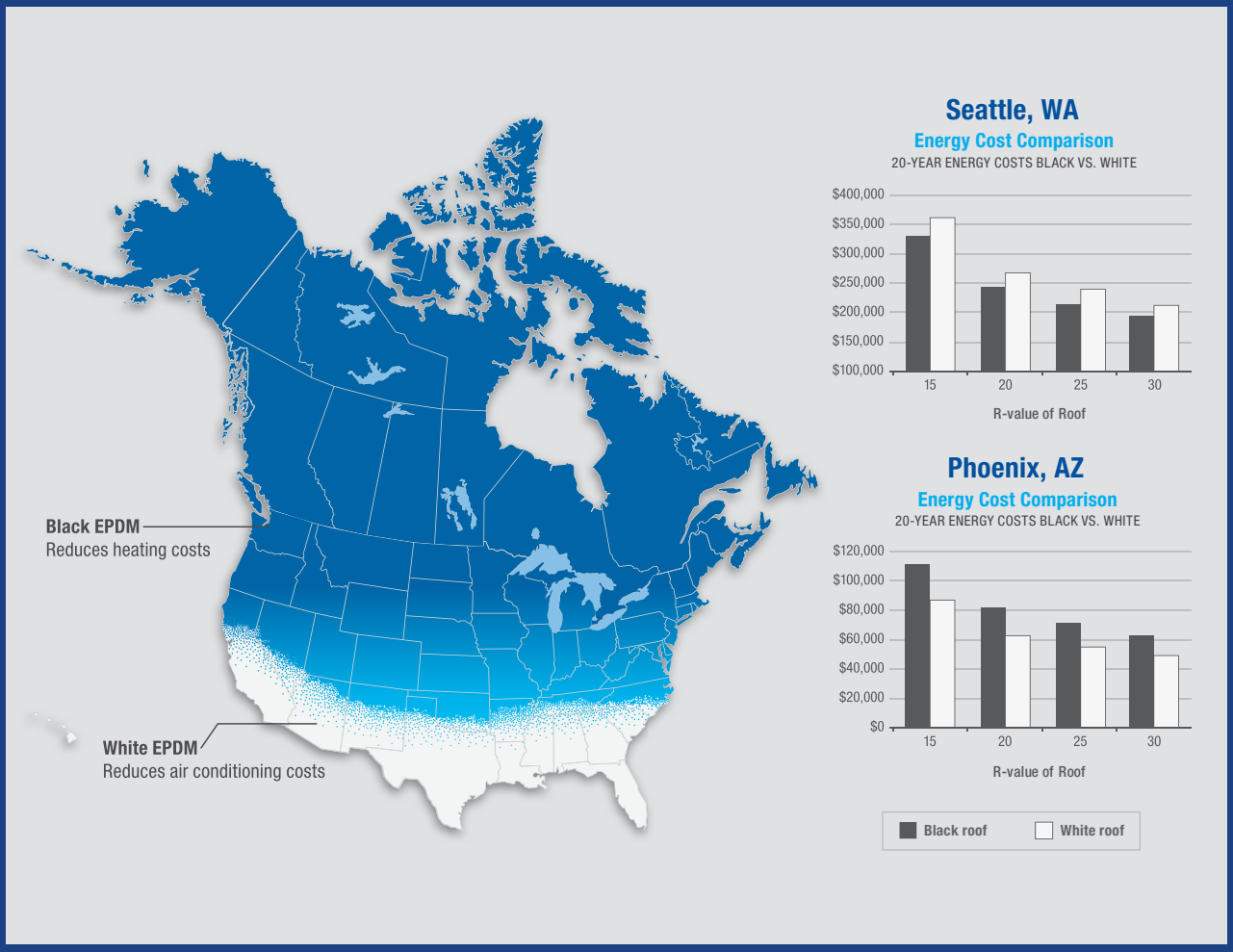


PUZZLE CLUES

Across
4. updating a property
6. how to upgrade building envelop
16. REIT
18. personal protective equipment
19. wax
20. second most important person in a hotel
22. something in addition to the room

Down
1. hotel offering room service
2. hotel catering to stays greater than 5 nights
3. list of available pillows
4. make new again
5. a critical service system
7. how to search for potential electrical hazard
8. morning phone call
9. maximize bed hygiene
10. hotel staff member in charge of special services
11. program for limited service hotel properties
12. modify existing equipment
13. one way to promote professionalism
14. dedicated to engineering excellence
15. mandatory nightly surcharge
17. most important person in a hotel
21. luggage



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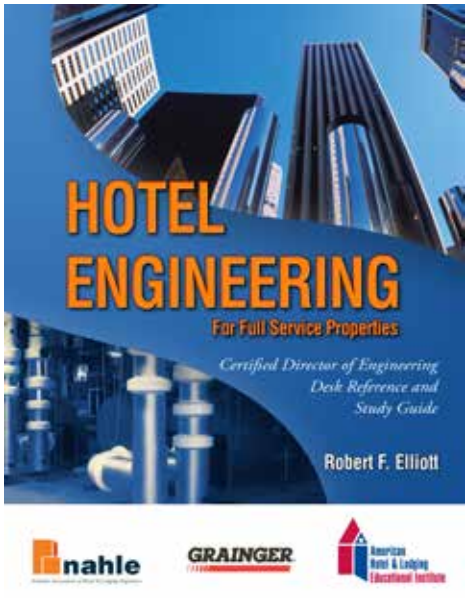
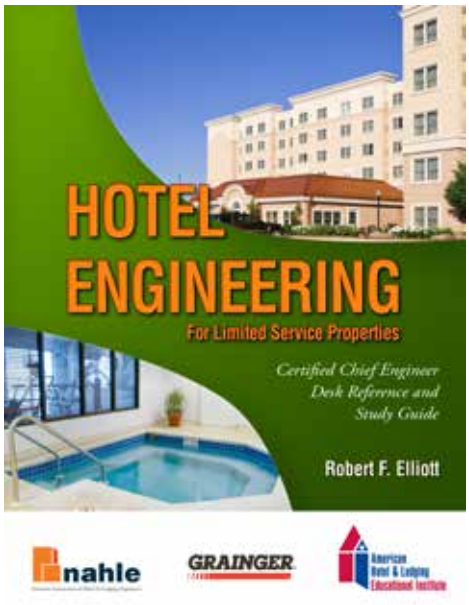
Certified Director of Engineering



Certified Chief Engineer



Training Today's Hotel Engineer To Be Tomorrow's Asset Manager

Certified Director of Engineering The (CDOE) is designed for full-service property engineers and their department heads or second(s) in command. 31 Chapters – 437 pages

Certified Chief Engineer Our (CCE) program is designed for limited-service property engineers and maintenance professionals who are often hourly employees. 19 Chapters – 265 pages

Our Curriculum is written in plain English with simple and easy to understand words. Our program includes information related to the planning and organizing of tasks, overviews of building engineering systems, and the financial and ethical skills required to operate effectively within a hotel organization. The limited-service program includes many common CDOE chapters as well as additional chapters that among others, focuses on; low-rise wood-frame construction, through-wall penetrations, saline pools, moisture infiltration and PTAC units.

The following provides a detailed program chapter analysis:

Management	Building Systems	Building & Grounds
Both Full & Limited Service • INTRODUCTION ** • PRIORITIZE TASKS / TIME MGMT.** • PROJECT MANAGEMENT** • ENVIRONMENTAL HEALTH & SAFETY** • EMERGENCY RESPONSE PLANNING** • MAINTENANCE OF THE HOTEL** Full Service Only ---------- • REPORT & LTR. WRITING* • RECORD KEEPING* • BUDGETING* • SUSTAINABLE OPERATIONS* • CONTRACTING FOR SERVICES* • BUSINESS ETHICS* • PROPERTY ACQUISITION/ DISPOSITION* • RISK MANAGEMENT* • BUSINESS CONTINUITY*	Both Full & Limited-- • ELECTRICAL SYSTEMS** • LIGHTING SYSTEMS** • FIRE & LIFE SAFETY SYS** • PLUMBING SYSTEMS** • HVAC** • VERTICAL TRANSPORT SYSTEMS** Full Service Only---- • SECURITY SYSTEMS* • ENERGY MANAGEMENT* • BUILDING MANAGEMENT SYSTEM*	Both Full & Limited--- • BUILDING DESIGN & CONSTRUCTION** • PARKING STRUCTURES** • SWIMMING POOLS & SPAS** • INTEGRATED PEST MANAGEMENT** Full Service Only----- • BUILDING COMMISSIONING* • WASTE MANAGEMENT* Limited Service Only-- • MOLD & MILDEW* • PTAC UNITS* • THROUGH-WALL PENETRATIONS*
FULL SERVICE = * *LIMITED SERVICE* = *	**Both programs are available for $685 each.**	**Additional test is $125 per.**

Program Attributes

Transferable: By focusing on the principles of management, building engineering systems, and the hotel building and its property grounds, we created a curriculum that is easily transferable across different hotel brands and property types.

Informed Decision Making: When hotel engineers become better informed, their decision making process improves and they in turn tend to lead others, especially their own staff, to a higher quality standard. This new level of professionalism is best reflected in your property's appearance, staff productivity and efficiency and increasing the useful life of your property's building systems and equipment.

Hotel Centric: Both our Certified Director of Engineering (CDOE) and our Certified Chief Engineer (CCE) programs are written exclusively for hotels and lodging properties. From the heart-of-the-house to the property's perimeter access, NAHLE's certification programs are all about hotels and the unique environment of mixed-use occupancies.

Self-Paced Study: Our programs are designed for engineers to study at their property and learn at their own speed. An experienced engineer should complete our full service (CDOE) program in about 40 hours typically stretched out over a few months. While the limited-service (CCE) program averages about 20 hours of study. Our curriculums are both based upon the engineer remaining on property and studying on the job.

Online Registration & Technical Support: Both Nahle and EI register candidates online and provide technical phone support.

Reporting: Nahle has online software available should you want to track study hours for limited-service candidates. We can also provide exam results for groups of properties.

Multiple Property Roll-Out: Our programs are designed for management companies to enroll multiple engineers in the program at the same time and have all candidates working toward their certification concurrently.

Online Exams: Candidates are designated as a certified engineer upon the successful completion of multiple sectional tests administered online by EI. The CDOE program has two tests and the CCE has three tests. Each sectional test is comprised of numerous multiple-choice test questions drawn from the Study Guide's individual chapters. A minimum passing score of 70% is required. Applicants may take Sectional tests twice.

Track Study Time: CCE (select-service) applicants may track their study time on NAHLE's website by accessing their own unique membership login. Hours of study may be entered for each calendar day in increments of 15 minutes and notes may also be typed in for future reference. A downloadable log of an applicant's total study time is available.

Certificate of Completion: Upon successful completion of the course, NAHLE issues an electronic certificate suitable for high quality color printing. The certificate designates the candidate as successfully completing the educational requirements to become a Certified Chief Engineer or Certified Director of Engineering.

NAHLE - Membership Services

- ***Lodging Engineer*** - NAHLE's official digital trade magazine focuses specifically on hotel engineering and maintenance. All articles are exclusively written for ***Lodging Engineer (LE)***. Members can access archived issues and print pdf versions. The electronic version of ***LE*** magazine also contains links for accessing additional product information including advertisers' websites.
- **eNewsletter** - our weekly eNewsletter focuses on current events and regulatory issues. Links to other online articles and magazines are provided allowing members to download featured articles and product advertisements for hotels.
- **Forum/Blog** – a electronic forum where 'members only' can exchange ideas and information with their peers in a threaded discussion format.
- **Job Bank** – a single source for finding and posting hotel engineering and maintenance job openings.
- **Calendar** – lists upcoming events, webinars, and meetings
- **Resource Library** – an organized and searchable database of both print articles and video. Documents include past LE articles, federal regulations, case studies, and maintenance checklists, etc. Videos are searchable and include 'how-to instructions' and product information.
- **Buyer's Product Guide** – an electronic buyer's guide which lists service vendors, suppliers and product manufacturers. Searches for local vendors by zip code.
- **Warranty / Permit / License Management** – a document management system that catalogues and tracks time sensitive information and documents such as warranties, permits and licenses. Program tracks unlimited number of documents in a three level searchable database that you create. The program sends you and other identified recipients a reminder via email of a future specified date or impending expiration that you choose .

Nahle's Value Proposition: Investing in your staff's professional development challenges engineers to apply their knowledge to the very same systems they are responsible for maintaining on a daily basis. Educational training creates trust and loyalty among your employees. And, perhaps most important, uniform education and training creates an environment of informed decision making. For hotel engineers and maintenance workers, completing a certificate program can be the most cost effective way to **Catch Up, Keep Up and Stay Ahead** of the competition. **(Read more at Lodging Engineer)** Studies show that men who complete certificate programs of less than one year earn roughly 10% more than those who do not have such a certificate (Georgetown University Study 2012). More and more owners expect their engineers to know and apply what is quickly becoming 'common knowledge.'

IT'S TIME TO JOIN

The National Association of Hotel & Lodging Engineers

Lets build our future together.

By joining NAHLE we both become stronger. Your support makes us stronger and in return NAHLE will help you by providing hotel engineering information and support your career advancement with NAHLE's Certified Chief Engineer (CCE) for select service and Certified Director of Engineering (CDOE) for full service properties. Together, we will build our futures. Membership Fee is $99 a year.

Your Member Benefits include:

- Weekly Newsletter with news that affects you and your property.
- Lodging Engineer Magazine, loaded with interviews and in-depth articles.
- Access to our new Website, www.nahle.org
- Resource and Video Library, Job Bank & Warranty Program.
- Plus a $100 discount towards your CCE or CDOE Certification.

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