

ISSUE

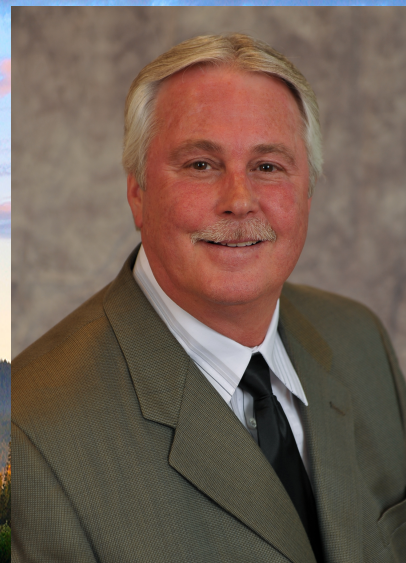
31

FALL 2018

# *Lodging Engineer*

The Electronic Magazine for Hotel Engineers

## 1<sup>st</sup> Person



**Interview with  
Bruce Slay  
Sun River Resort**

### *Featuring:*

*Is Systems Engineering in Your Future?*  
*The Economics of Smoke Alarm Replacement*  
*Hot Water is a Comfort Priority*  
*Safety Tips to Prevent Ladder Injuries*  
*Leveraging Energy Management Technology*



# Lodging Engineer

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.

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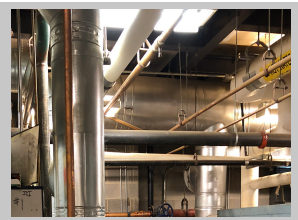
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Starting in 2020 hundreds of millions of smoke alarms in commercial buildings including hotels will require replacement. **Tom Daly returns to Lodging Engineer** discussing the impact of the 2018 edition of the International Fire Code now being adopted by states and localities across the US.



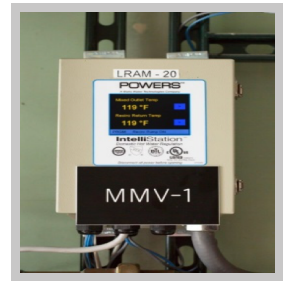
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Ladders are a common tool utilized by the maintenance and engineering staff in nearly every hotel. Don't become the next ladder statistic, reduce your chance of falling by observing some common-sense safety rules when using a ladder.



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As technology advances shifts in the balance of supply-and-demand markets are a given, but one thing doesn't change; the need for energy consumption. John Attala discusses leveraging technology to save on energy costs.





1st Person Interview With

# Destination Hotels' Sun River Resort, Oregon



featuring

## Bruce Slay, CDOE

**B**ruce, it is a real pleasure to catch up with you and share this interview with our readers. I believe we briefly met at your corporate conference meeting at the awesome La Cantera Resort in Texas a few years ago. As you may recall, I was invited by Mike Shutts, Vice President of Engineering at Destination Hotels & Resorts, to speak about NAHLE's online engineering training and certification programs.

I'd like to start off with a little background information. Can you tell our readers how you started your career and then how you ended up at the Sun River Resort in Sun River, Oregon?

I started at the Sun River Resort in 1991 and have been here for 26 years. I first started working in maintenance over 30 years ago for an investment company in California. Primarily they developed apartments and were looking for a maintenance worker. I showed up for the interview in a 1958 Dodge truck with a ladder rack and tool box. They

hired me on the spot, and to this day I believe that showing up in my '58 Dodge was what got me the job.

I then went from facilities to working construction as a carpenter. My boss, John Sutter, owned a sail boat and I got to spend a lot of time on it with him over the five years that we worked together. I have picked up a few life lessons over the years and the one I still use the most in my job today was taught to me by Mr. Sutter.

**Tell us about your current property.**

Sun River Resort is a luxury resort located in central Oregon. We are owned by Lowes Enterprises and managed by Destination Hotels & Resorts, which is one of two brands within Two Roads Hospitality. I am proud to say our resort is currently celebrating its 50th anniversary!



The property was initially established by the War Department as part of a 5500-acre combat engineer replacement and training center. Built by the Army Corps of Engineers, it was established as Camp Abbot in 1942 in honor of one of the two original land surveyors in 1855. The base opened under the command of Colonel Frank S. Benson in 1943. Over 90,000 combat engineers were trained at Camp Abbot. It was later closed in 1944 and then left abandoned for many years.

The property is located among the Sun River and the Deschutes River. We have over 318,000 square feet under roof, which includes over 45,000 square feet of meeting space. We have three 8-hole golf courses and one 9-hole course. We even have our own airport located on the property.

Our resort now has 54 buildings spread across 36 acres. Sun River Resort is now primarily a destination for weddings and business travelers. We also have 300 homes located on our property, multiple swimming pools, and three spas located throughout the resort. We have a horse stable and several horseback riding trails, in addition to the 40 miles of bike trails on our property. Our marina also supports guests that want to take a canoe or raft down the Sun River.

## **STAFF:**

### **How many employees do you manage and how are they divided among hours?**

I have a total staff of 16 employees and am responsible for maintaining all 54 facilities. Ten of my employees are field technicians, overseen by one supervisor and an assistant supervisor. Our grounds department has three maintenance technicians and one supervisor. We also have a painter under contract. Our staff is made up of two shifts that work between the daily hours of 7 AM and 11 PM. By way of a duty phone, we share the remaining shift of 11 PM to 7 AM among a few of us who are 'on call' during these hours.

## **MANAGEMENT:**

### **Would you speak to your management style and experience?**

My management style is based upon being prepared so that my team and I can always make informed decisions. It is so important in our industry to train people to be competent. I call this 'Empowering Prepared People.'

At our resort I find communication is key to our success. I like to get in front of staff at our 'stand up' meetings and engage employees. I also try and get out in the field often and do preventive maintenance with the staff. I think a hands-on approach is crucial in keeping people connected.

## **HIRING**

**I know hotel engineers are often characterized by their love to 'fix things.' In today's market they usually have strength in a particular area. Can you talk about your hiring process and what you look for in a new employee?**

When I interview an applicant, I look for experience in facility repair such as electrical, painting, plumbing, or mechanical. But, sometimes it helps to think outside of the box. For instance, I'll ask about their hobbies. I often find applicants have a related hobby, like working on cars or boat motors, that develops many applicable skills.





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***“Not everyone knows the importance of taking the time to instruct others and show them the right way to do things.”***

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*Tillamook River*

I also look for job certifications in a new hire. This includes safety training such as slip, trips and falls, as well as life safety training for the use of respirators and Automatic External Defibrilators (AED).

When I first hire a new employee, I conduct what I call a ‘job verification.’ Because the property is so spread out, it is very important that new hires know where all our buildings are located and how to get them. My ‘job verification’ requires each new hire to locate on a map each of the various buildings and their rooms. They must also locate where a building’s systems, such as electrical panels and plumbing systems, are located. I have them verify fire alarm systems and how to silence a fire alarm system. I then have them sign off on their maps. We give an employee three months to learn our property maps.

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***“Applicants don’t always have to ‘fit the mold’; their desire to succeed goes a long way. ”***

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Another important part of facility maintenance is interacting with guests. We demand excellent guest service from our employees. We allow a new hire six to eight months to become familiar with our ‘Associate’s Handbook’ which covers guest services.

Many new hires will request more job training or industry certifications, which is something I highly encourage. I believe it helps them develop their strengths.

**You mentioned thinking outside of the box when looking for an applicant’s relevant experience. Any success stories from this approach?**

One employee particularly comes to mind. I hired this candidate from what I call “Public Space.” What I mean by this is that they had no experience or any related training in hotels or facilities maintenance. I interviewed a woman, Jenna, who had training in welding and a strong desire to succeed, but no experience in hotels. So, I took a risk and it paid off. Her skill set translated well to the hotel environment and she has been a huge asset to our team. Applicants don’t always have to ‘fit the mold’; their desire to succeed goes a long way.



## **What advice would you give to someone looking to advance their career?**

I believe that pursuing training will have the biggest impact on your career. Take advantage every opportunity to train or advance in your career. From a broader perspective, I would say embrace new technology. The customer is changing and the technology used by 'Baby Boomers' is going to keep changing and evolving for the next generation of guests, the millennials.

## **SUSTAINABILITY:**

### **Can you describe your property's efforts toward sustainability and energy efficiency?**

Two of our buildings are LEED certified, and one is even certified at the Silver level. We have also been working with Energy Trust Oregon (ETO) on several projects and realized considerable success. We initially spent \$400,000 on various utility and insulation projects involving ETO and, Pacific Power and Mid-State-Electrical. We spent \$35,000 for a Technical Analysis Study (TAS) to gather information and put together a report with utility recommendations. When we finished we received \$110,000 back from EOT.



*Homer Alaska*

### **How did you decide to get involved with ETO?**

We put in an application with ETO showing our gas and water savings, specifically the replacement and retrofit boilers we had targeted due to the findings from our TAS. We also looked at the efficiency of the heaters used in the pools and spas. ETO came back and recommended high efficiency boilers.

Lastly, we completed a five-year retrofit of lighting at our resort that included all main buildings. We now use LED lighting in all locations, many of which used to be lit by incandescent bulbs. This saves money and benefits the environment.

## **EDUCATION & TRAINING:**

### **How do you train your staff?**

I have successfully completed NAHLE's Certified Director of Engineering (CDOE) training and loved the program. It is pertinent to what I do every day. I have started Mike Dean on my staff with his Certified Chief Engineer (CCE). It is great way to transition some of my field technicians, so they can learn more about how a chiller works, how to interact with guests, and how to deal with service contractors.









Sunriver Resort Lobby



## TIME MANAGEMENT:

**How do you stay disciplined and focused on your daily activities?**

I personally use Outlook's 'Task Calendar' to help keep up with operational issues. I report to the director of operations and in Outlook I can click on documents, tasks, and capital projects and pull everything in 'Notes.' I have developed a color-coded system working in Excel where I use one color to highlight an upcoming task and another color once it is completed. With 'Notes' I can provide a brief description of a task or capital project and key facts, such as the contractor, start date, or when a particular part was ordered. These programs are both excellent communication tools.

## FISHING & OTHER HOBBIES:

**It seems all engineers love a good fishing story. Do you have any you'd like to share and maybe a photo or two to back it up?**

One of my favorite hobbies is to fish. I have a 20-foot boat which I mostly use for lake fishing. I usually find about 4 or 5 months in season for fishing. In April and May I like to fish for rainbow trout and I can fish for Salmon June through October. I am planning on going to Alaska for vacation this year and hope to fish for halibut.

**What are you going to do when you retire?** My wife and I are planning on retiring on the Oregon coast. I hope to sit back and relax, maybe pop open a Corona, and do a little more fishing.

\*\*\*

## *A note from your editor,*



*I believe we now have one of the biggest challenges yet facing our industry; finding, training, and retaining workers for jobs in hotel engineering and maintenance. NAHLE has the tools in place to help support these challenges and grow the profession, but we can't succeed if you don't get involved. We need both your financial support and your intellectual support as contributors of ideas, leadership and articles. What each and every one of you can contribute individually benefits the entire industry as a whole. The very same problems and challenges you face at your hotel are the same ones your peers are facing at the hotel right down the road from you. It is my personal conviction that together we can build a trade association that provides educational opportunities to improve professional development and interest in the profession while also striving to improve hotel asset-management by creating an environment of informed decision making.*

*Please ask yourselves what you; hotel engineers, corporate managers, and owners can do to help meet these challenges and pass along your 'institutional' knowledge to your staff and the next generation of hotel engineers. If you like what we are doing, then please support the National Association of Hotel & Lodging Engineers.*

***As our nation's 26th President, Theodore Roosevelt said...***

***“Every man owes a part of his time and money to the business or industry in which he is engaged. No man has a moral right to withhold his support from an organization that is striving to improve conditions within his sphere.”***



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# WHY YOU MAY BE REPLACING ALL OF YOUR SMOKE ALARMS IN 2020

by

Thomas Daly  
October 2018



*Thomas Daly MSc CSP CLSD CASp is the President and Managing Member of the Hospitality Security Consulting Group, LLC. He retired as the Vice President Loss Prevention for Hilton Hotels Corporation, now Hilton Worldwide and is the former Chairman (twice) of the NFPA Lodging Industry Section.*

## Starting in 2020 hundreds of millions

of smoke alarms in commercial buildings including hotels, motels, lodges and inns along with time-shares, apartments, condos, dormitories, board and care facilities, assisted living facilities and similar residential and institutional buildings will require replacement under a provision of the 2018 edition of the International Fire Code (IFC)<sup>1</sup>, now being adopted by states and localities.



Forty-two states, the District of Columbia, Guam, Puerto Rico and the U.S. Virgin Islands adopt the IFC as the basis for their state and local fire codes<sup>2</sup>.

That provision of the IFC requires the replacement of smoke alarms at 10 years of age, regardless of operating condition. The ICC recently issued an interpretation confirming that this obligation in the 2018 IFC at Sec. 907.10 applies to existing smoke alarms in existing buildings so equipped, even though this requirement was not placed in the code's Chapter 11 Construction Requirements for Existing Buildings. Typically, new language, as Sec. 907.10 is, only applies to new construction or new equipment installed in existing buildings.

On appeal by the Hospitality Security Consulting Group, LLC (HSCG), the International Code Council's (ICC) Fire Code Interpretation Committee (FCIC) reaffirmed their earlier interpretation on August 15, 2018, without any specificity as to why. A further appeal of that decision is pending before an independent Appeals Board appointed by the CEO of the ICC, but the outcome will not be known until late 2018.

One might ask why a perfectly good working smoke alarm at 9 years and 364 days of age is just fine but the next day must be replaced? Is your initial investment in these alarms now...well...going up in smoke?

<sup>1</sup> 2018 IFC new Section 907.10.

<sup>2</sup> States will adopt the 2018 edition of the IFC at different times with Wyoming the first in August 2018 and California scheduled to do so at year end 2018 with a proposed effective date of 1.1.2020.

<sup>3</sup> 2018 IFC Code Interpretation 01-18, May 15, 2018.

While most sleeping accommodations in hotels, save for suites, have only one smoke alarm, other occupancies including apartments, time-shares, condos and dormitories typically have 2-5 smoke alarms in each unit.

In a partial victory for the lodging industry the California State Fire Marshal has proposed not adopting the 10-year replacement obligation in the state's pending adoption of the 2018 IFC as the 2019 California Fire Code, after public comments and testimony by the California Hotel & Lodging Association (CH&LA). The state's Building Standards Commission will decide the issue when they vote at year end on the code's adoption. Stay tuned.

So, what's next?

A code change proposed by the HSCG for the 2021 edition of the IFC would clarify the intent of Sec. 907.10 to apply only prospectively, such that existing smoke alarms in existing buildings would be exempt from the replacement requirement. That change however is being opposed by the ICC's Fire Code Action Committee, so is unlikely to be approved at the final ICC Code Action Hearing this Fall.

Short of prevailing on the final appeal or instituting litigation against the ICC to overturn this ruling or challenging this issue state-by-state, building owners and operators are faced with both the economic impact and the installation challenge of such replacements, including disruption to guests, tenants and patients in these various occupancies.

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***"If 200 million smoke alarms are to be replaced in 2020/2021, then using the 10-year battery-only powered smoke alarm as the replacement could reduce the cost to building owners and operators nationwide by \$2.6 billion, no small sum."***

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The material cost, including taxes and shipping, for a typical smoke alarm powered from the building electrical service (120vac) with a battery (9v) backup, required by building codes for hotel rooms since the '90s, is about \$35, plus the labor cost to install. An alternative is a battery-only powered smoke alarm with a 10-year non-replaceable sealed lithium-ion battery. The material costs for that option is about \$22.

So really, not much of a choice economically? But wait. The question arises as to what the fire code will allow. If the building and fire codes applicable to a building when constructed required a 120vac powered smoke alarm with a 9v backup battery, can you now substitute a battery-only powered smoke alarm when the replacement obligation in the fire code arrives? That question is unanswered at this time. The IFC is silent on this issue. The decision involves an enforcement issue, usually answered at the state or local level.

The approximate \$13 per unit cost differential when measured against the hundreds of millions of units to be replaced, is staggering. Most of those replacements occur in the first years of the 2018 IFC's adoption (likely in 2020 & 2021), due to the age of buildings so equipped (the vast majority are more than 10 years old now), .

If 200 million smoke alarms are to be replaced in 2020/2021, then using the 10-year battery-only powered smoke alarm as the replacement could reduce the cost to building owners and operators nationwide by \$2.6 billion, no small sum.

Affected industries should seek an answer to this question, sooner rather than later.

\*\*\*



# Is Systems Engineering in Your Future?

by

**Miriam Rich**

Marketing and Communications Manager  
Vitech Corporation



As a hotel engineer,  
you've seen it all. How about this one: A

guest checks in to your hotel and arrives at their room after a long trip, eager to clear their mind and get some rest. They begin to draw a bath, and while waiting for the tub to fill, lie down on the bed. Before they know it, they fall asleep, the tub overflows, and you get a call about water leaking.

Just a day in the life, right?

Hotel engineers are the unsung heroes of the hospitality world—the glue in the background that holds everything together, keeps things running and makes things work.

“We like to be unheard and unseen. If people don’t know we exist, we’re doing our job.” This quote, as you might expect, comes from a hotel engineer. Yet there’s another profession whose practitioners are likely to say the same thing. I’m speaking of the systems engineer. It turns out the two might be able to learn from each other.

Chris Compton, the author of the quote above, is a hotel engineer at the Inn at Virginia Tech in Blacksburg, Virginia. He knows well the challenges of managing a highly complex system. He’s been with the Inn at Virginia Tech since it opened in 2005, and with another establishment before that. With 147 guest rooms, 190,000 square feet, a full conference facility and a commercial kitchen, the Inn has a lot of moving parts and any number of things that can go wrong on a daily basis. And within all of this, “I handle everything, from A – Z,” Compton says.

Furthermore, he embraces an attitude characteristic of hotel engineers—taking responsibility for the property they oversee. “I take ownership,” he asserts. “This is my house when I come into it.”

Gene White, at the Courtyard Marriott in Blacksburg, concurs. The hotel where he serves as chief engineer has 96 rooms. “It’s like taking care of 96 houses. Each room is like a house.” And with each “house,” as he sees it, it’s his responsibility to make sure everything is working as it should.

Systems engineers share the same “ownership of the problem space” outlook. Where they help people solve complex problems, they bring a systems outlook. But just what is that?

### What is systems engineering?

The benefit that systems engineering brings to the table is that it helps humans deal with problems that are too big to keep in one person’s head, or even, several persons’ heads. It considers all elements that meaningfully affect a system, and it holds everything in its gaze at the same time—from the smallest detail to the 30,000-foot view. A bit like—God. You can see why systems engineers must guard against arrogance!

But most importantly, systems engineering helps people guard against unintended consequences. When things go right, it just may be that a systems engineer helped design the system. And when things go wrong—it’s likely that one was not involved. More often than not, examples of the effectiveness of systems engineering are seen in the absence of a problem. Just as, for the hotel engineer, as Compton noted, when no one knows you’re there, things are probably going well.



Said another way, the lack of systems engineering is evidenced by the presence of a problem. For example: Samsung phones spontaneously combusting, the Deepwater Horizon oil spill, the tsunami-induced nuclear reactor accident near Sendai, Japan—all of these are instances of systems failures where the powers-that-be had not engaged the services of a systems engineer.

But hang on. I just said that systems engineering deals with problems that are bigger than one person can hold in their head. How then can a systems engineer, a single person, deal with such a problem? By means of a tool.

## Model-based systems engineering

This is where model-based systems engineering comes in, or MBSE, for short. MBSE software is just such a tool.

In the old days, if you were designing a fighter jet or a car, teams of engineers were assigned to different parts of the finished product. For a car, one team of engineers might be assigned the combustion engine. Another team might be assigned the brakes. Another the suspension, and so on. Teams worked for the most part in isolation, and their designs were worked out on paper.

When a change was made, that change had to be propagated by hand onto all of the other relevant sheets of paper. Perhaps you had to walk down the hall to see Bob, and make sure that he made the change on his document. But, as you might expect when you introduce humans into the process, this didn't always happen. Sometimes, the information got transmitted incorrectly. Or not at all. And when a system failure results in loss of life, this is not permissible.

While we have been speaking of designs where decisions can have life and death impacts, other less high-risk systems benefit from systems thinking as well. A German high-tech company, for example, was faced with growing friction within the ranks and decided to do a reorganization of the company. Of particular interest to the president was how communication happened. How did the flow of information really occur? Who did what, and when? What were the roles beyond the lines of reporting? How did things get done? An organization chart may show ostensible lines of power and control, but what actually happens can be something else entirely.

The company used a model-based systems engineering tool to model the process. According to Alejandro Salado, a systems engineer involved in the process, "The system we modeled allowed management to see beyond just the org chart. When you bring in structure, you can see things more clearly. Clarity helped us redesign the organization to improve the way we worked. We were all able to move forward in a positive way."

A hotel, as a system of systems, includes multiple parts that can have impacts on one another: fire alarm systems, sprinkler systems, HVAC, water, waste management, security systems, etc. No part exists strictly in isolation. A smoothly functioning whole is like a Disney experience: nothing messy, out of place, or broken.

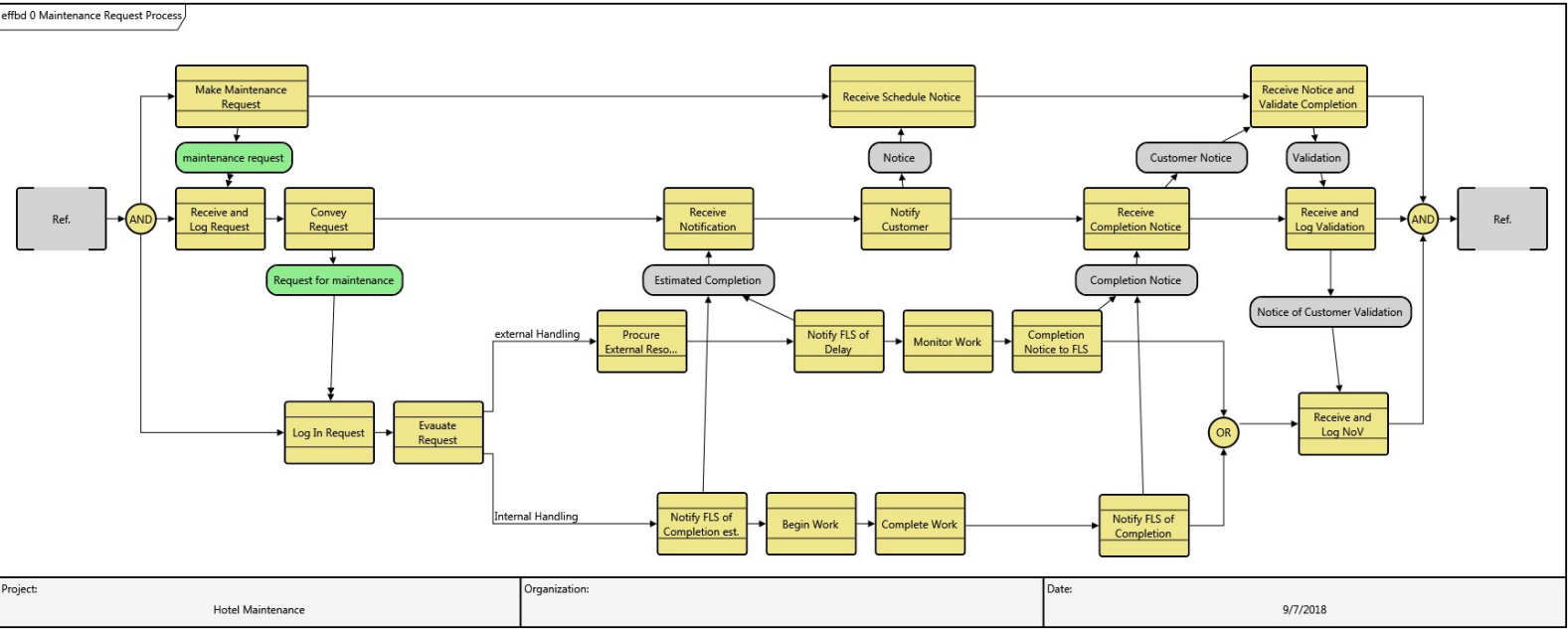
But the beauty that systems thinking applies is that it is not about optimizing the sub-components and then putting them together; it's about building up your system concurrently, going from broad brush strokes to fine detail and pulling in all relevant elements as one goes. And all along the way, one includes the stakeholders and inputs their concerns and insights into the process.



## The biggest benefit of a model? Insight

With a software model that captures all these aspects and can track all the changes and concerns, you don't have to rely on documents that may live with various people in a variety of places that you then must bring together and harmonize. Everything is in the model.





Project:	Hotel Maintenance	Organization:		Date:	9/7/2018
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Furthermore, the model allows you to propagate changes on the fly. Change one thing on the model, and it gets changed globally. The model will show you where you have problems. It can show you when they're resolved, how, and by whom. If a manager leaves the project, someone else can step in, even years later, look at the model, and know exactly what's going on. This allows you to maintain consistency over time.

Representations of the model allow for multiple views, allowing you to choose a view that will resonate best with a particular audience.

Finally, these immediate benefits lead to other benefits, the biggest of which is insight. You might say, "Well, of course. If I sit down and think about something for a while, I'm sure to have some insight on it." True, but if you sit down and think about your problem—or hotel systems—by methodically working through it via the different systems engineering domains, you are bound to have insights. Systems thinking imposes a discipline that forces one to think through the entire lifecycle of your product or project, or hotel. From birth to death, how will this thing operate? What will it impact? What will impact it? This kind of thinking helps you prevent unintended consequences.

Ponder this koan-like question: What is the cost of a problem you don't encounter? Said another way, what is the value of not encountering a problem? Ask the Deepwater Horizon people. Model-based systems engineering software and systems thinking can help people avoid unintended consequences and get the outcomes they want, rather than the ones they get.

White's employer, in looking to build a new hotel next door to the present property, exhibited good systems thinking in its construction. They consulted White, a key stakeholder, pulling him in during the design phase, knowing that he has an intimate knowledge of how hotels operate at a granular level. He would, they guessed, be able to help them design a better system. White was able to recommend that they put drainage pans under the shower stalls. \*\*\*

Miriam Rich is the Marketing and Communications Manager for Vitech Corporation, a firm that makes model-based systems engineering software as well as providing systems engineering training and consulting. Vitech makes CORE and GENESYS, two powerful model-based systems engineering tools.



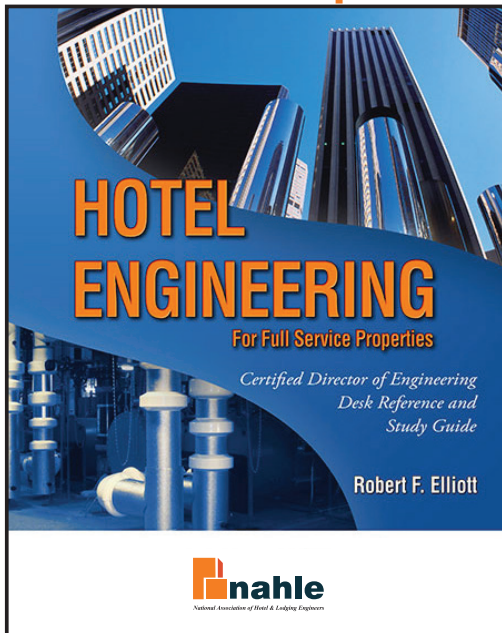
# NAHLE Training and Professional Development

*NAHLE has developed two educational programs for hotel engineers through a partnership with the American Hotel & Lodging Educational Institute.*



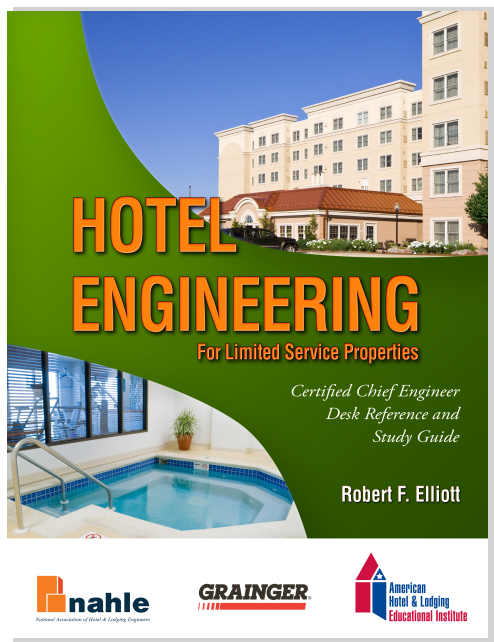
Celebrating 60 Years of Hospitality Excellence!

## Full Service Properties



*This 31-chapter study guide provides preparation for the Certified Director of Engineering (CDOE) professional designation offered by NAHLE for hotel engineers. The Guide includes information related to the planning and organizing of tasks, overviews of hotel engineering systems, and the financial and ethical skills required to operate effectively within a hotel organization. NAHLE's CDOE curriculum is comprehensive and covers most all hotel building engineering subjects including: HVAC, plumbing, electrical, lighting, landscaping, swimming pools, vertical transport systems and many other areas. NAHLE's certification tests are provided online so that the engineer never has to leave the property.*

## Limited Service Properties



*The Certified Chief Engineer (CCE) was developed specifically for hotel engineers at limited service properties. The Study Guide has 19 chapters that focus on low-rise wood frame construction properties with a comprehensive review of subjects including PTAC units, moisture infiltration, building systems and maintenance, and engineering principles. NAHLE's online certification test is provided by our educational partner, the American Hotel & Lodging Educational Institute. Corporate/ Allied members are encouraged to sponsor and support NAHLE's Hotel Engineer Certification programs.*



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*- AH&LA Industry Profile*

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advertising to save money  
is like a man who stops a  
clock to save time."**

**- Henry Ford**



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# ***Hot Water's a Comfort Priority***

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## **Portland's new AC Hotel Opts for Essential Amenities**

**G**uests at the AC Hotel Portland Downtown have learned not to expect full-on room service, a five-star restaurant or vast meeting spaces. Rather, they dismiss the lavish add-ons, opting instead for contemporary comforts – and it's all by design.

Visitors to the hotel will encounter an ultramodern hotel resplendent with sleek amenities, craft cocktails and live music in the lounge and tidy meeting spaces with views of the Willamette River and Mt. Hood.

The 204-room hotel, a project from Colorado real estate developer McWhinney and Sage Hospitality and Mortenson, broke ground in June 2015. Its 13 stories occupy a prime location in the downtown area. The new hotel opened for business in early 2017 and, since then, occupancy has been an enviable, steady 92 percent.

In addition to its rooms, the AC Hotel Portland – a Marriott brand – features a ground-floor lounge with a cocktail bar, the AC Kitchen where guests enjoy continental breakfast and streamlined snacks, and the sensory comforts of an aroma-rich Portland's Water Avenue Coffee franchise.

Guests also enjoy revolving exhibits by local artists in common areas, plentiful meeting spaces, rooms with an “all-the-essentials” design, including one key essential: plentiful hot water on tap.



## A Marriott Hotels directive

Long before breaking ground for the new hotel, facility managers smartly decided to install a digital thermostatic mixing station for the AC Hotel's domestic water system.

By now, most folks in the business of hotel management have learned about the challenge of providing hot water to hotel rooms, quickly and consistently.

Mechanical mixing stations, which typically incorporate the use of pressure reducing valves to help offset widely-varying pressures, and temperatures, within large domestic water systems, were once the standard. Those days are gone.

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***“Facility managers were preparing to meet a new Marriott directive, a specification from the parent company's directors, stating that all Marriott hotel properties must be capable of delivering hot water to guest rooms within 10 seconds. For large hotels: that's fast.”***

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## Digital renaissance

The digital Renaissance in building systems – now in full swing, with no end in sight –has created a broad range of new technologies that provide for greater safety, performance, consistency, control and energy savings in high-performance buildings like the AC Hotel.

New digital mixing and recirculation systems, replacing decades-old mechanical devices, offer smart water delivery solutions to all points of use within a variety of commercial or municipal facilities, including hotels. They also mix domestic water in a hot water recirculation loop and can be integrated into a building automation system (BAS).

Today, most large plumbing systems are designed around the use of digital mixing and recirculation stations that allow for the integration of hot water delivery systems into automated program controls. These new mixing stations control the entire tempered water recirculation loop at safe temperatures using electronic mixing valves, fast response sensors, and high-speed actuation.

They can limit temperature regulation to exceed the requirements of the American Society of Inspectors of Plumbing and Sanitary Engineers, ASSE 1017 – typically reducing temperature swings to within +/-2 degrees F. This provides a measure of control, and energy savings, that cannot be achieved with mechanical systems.

## The spec

Both PAE Engineering and TCM Engineering Services were tapped for design expertise. Initially, TCM specified a different digital thermostatic mixing system, but hotel managers resisted because the price seemed prohibitively high.



Several months later, and after ground was broken on the project, Watts Water Technologies expert, Dan Checristi, and Luke Erickson, with Seattle-based Stone-Drew/Ashe & Jones (SDAJ), were invited in to introduce TCM design engineers to the IntelliStation (IS) system.

Shortly after the visit by Checristi and Erickson, Eric Walczyk, technical associate, PAE Engineering, visited a nearby hotel's domestic water system retrofit that included an IntelliStation.

"Managers of a large hotel just a few blocks away had recently purchased the installation of an IntelliStation and were nice enough – as competitors – to give us a tour of the work they did there to improve domestic [hot] water consistency," said PAE's Walczyk. "They were very pleased with the system's performance, and I was also impressed with it."

Walczyk had prior experience with digital mixing for large domestic water systems, so his scrutiny of the Watts technology meant a lot to the others. He explained that, during system design, the "VE" (valve engineering) specifications called for digital mixing, and it set a high standard for the requirement. Yet, after close study of the technology and its capabilities, the IntelliStation passed easily.

After 20+ years of engineering building systems for large facilities, Walczyk says "I've seen my share of hotels where hot water delivery has been a problem. Yet, in the hospitality business, guest comfort is paramount. Running out of hot water is one of the seven deadly sins of operating a hotel."

So, with new technology comes the ability to end a problem before it manifests itself at a hotel. These days – as we've seen with the new Marriott Hotels directive – there's no tolerance of an inability to provide hot water to any and all points-of-use, whether it's on the first floor of a hotel, or on the highest.

## Installer insights

"The PAE design was spot-on, with an accurate submittal that enabled us to make a smooth installation of the digital mixing station," said Aaron Marlia, the jobsite supervisor for TCM Corporation, the Portland-based plumbing and mechanical contractor chosen for the job.



“It was my first experience with a digital mixing system, so I was very happy that we had no issues piping up to it, and also a smooth start-up,” added Marlia. “The installation was quick, and very much worth the cost in terms of guest comfort and value to the owner.”

## Digital – vs – hydropneumatic

The AC Hotel’s chief engineer is Steve Morates. He says that, “The difference between hydropneumatic (mechanically-operated) thermostatic mixing for a hotel or large facility is that a digital mixing station is constantly adjusting by small measures. Mechanical valves require large swings in pressure or temperature to activate.”

“We’ve really come to appreciate the fine-tuning and adjustments that the digital mixing station provides,” added Morates. “The system has performed flawlessly and is essentially maintenance-free.”

He added that – especially because of the hotel’s high occupancy year-round – they’ve been attentive to system operation.

“Preemptively, we’ve checked the return water temperature sensor routinely,” continued Morates. “After eight months of operation, we pulled it out to check it – and it looked brand new.”

“We’ve become fully confident in digital mixing technology,” concluded Morates. “Just as many building systems have seen improvement in the ‘digital age,’ our domestic water system here at AC Hotel – with digital mixing – performs exactly as designed.”

\*\*\*

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# *Safety tips to prevent ladder injuries in your hotel*

You don't need me to remind you that climbing ladders is potentially dangerous. Ladders are a common tool utilized by the maintenance and engineering staff in nearly every hotel. They enable personnel to reach high places for a variety of reasons such as hanging banners, changing light bulbs, checking sprinkler heads, dusting high areas, accessing roof areas, and so much more. Many of the basic safety rules that apply to most tools also apply to the safe use of a ladder.

### **Reduce your chances of falling**

Follow this advice and it just might keep you from becoming a ladder statistic.

#### ***During the climb:***

- Wear slip-resistant shoes with heavy soles to prevent foot fatigue;
- Clean the soles of your shoes to maximize traction;
- Use towlines, a tool belt, or an assistant to convey materials so that your hands are free when climbing;
- Climb slowly and deliberately while avoiding sudden movements;
- Never move a ladder while standing on it; and
- Keep the center of your belt buckle (stomach) between the ladder side rails when climbing and while working.
- Do not overreach or lean while working so that you don't fall off the ladder sideways or pull the ladder over sideways while standing on it.



***Use the “Three Points-of-Contact” when climbing a ladder.*** It is safest to use the "Three Points-of-Contact" approach because it minimizes the chances of slipping and falling from the ladder. At all times during ascent, descent, and working, the climber must face the ladder and have two hands and one foot, or two feet and one hand in contact with the ladder steps, rungs, and/or side rails. Thus, it is unlikely that the climber will become unstable if one limb slips during the climb. The climber must not carry any objects in either hand that can interfere with a firm grip on the ladder. Otherwise, the climber cannot maintain the “Three Points-of-Contact” with the ladder and the chance of falling is increased if a hand or foot slip occurs.

Use the right ladder for the job. Make sure the ladder is suited for the type of job you plan to do. Ensure the weight the ladder is supporting does not exceed its maximum load rating. (Load ratings are always posted on the side of the ladder.) This would include the weight of the user plus any materials. Ladders used in hotels should be Type 2 (medium duty commercial; which can support 225 lbs.), or Type 1/Type 1A/Type 1AA (heavy duty industrial; which can support 250 lbs./300 lbs./375 lbs. respectively).

Inspect and maintain ladders regularly. Stepladders and extension ladders should be inspected for broken or frozen joints or latches. Aluminum ladders should be inspected for cracks and broken welds. Aluminum ladders should also be inspected for rough spots and burrs before first use.

Wood ladders should be inspected for cracked wood, splinters, and rot. Look for broken or loose hardware. Protect wood ladders with linseed oil or clear sealant. Never paint a wooden ladder as the paint may hide imperfections, such as rot or cracks. Fiberglass ladders are protected with a clear sealant. If the fiberglass is damaged through the sealant, sand lightly before applying another coat of lacquer. Never use damaged or defective ladders.

*Use a ladder that is the proper length for the job.* Proper length is a minimum of 3 feet extending over the roofline or working surface. The three top rungs of a straight, single, or extension ladder should not be stood on.

*All metal ladders should have slip-resistant feet.*

*The ground under the ladder should be level and firm.* Large flat wooden boards can be braced under the ladder to level a ladder on uneven ground or soft ground. A good practice is to have a helper hold the bottom of the ladder.

*Metal ladders will conduct electricity.* Use a wooden or fiberglass ladder near power lines or electrical equipment. Do not let a ladder made from any material contact live electric wires.

## Stepladder Safety

Stepladders come in several sizes.

### Regardless of the ladder size, the following safety rules apply:

1. First, when opening a stepladder, check to confirm that the two hinged metal braces, called spreaders, are locked down and straight.
2. Never set up a stepladder on uneven ground. Each of the ladder's four feet must make firm contact with the ground or floor.
3. Tempting as it may be, never sit or stand on the very top step of the ladder. In fact, ladder manufacturers recommend never standing above the third highest step.
4. Only climb up the front of the ladder, never the back side. Don't allow more than one person at a time on a stepladder. (The exception is when using a specially engineered two-person stepladder, which has steps on both sides.)
5. When working from a stepladder, keep your hips within the two vertical rails. Reaching too far to the left or right could cause the ladder to topple.
6. Remove all tools and materials from the ladder before moving it.
7. Don't lean a closed stepladder up against a wall and then climb it. It can easily slide out from under you.
8. Never stand on the paint shelf.
9. Don't leave stepladders unattended. When you're done working for the day, or if you take an extended break, close the ladder and put it away, or at least lay it down.





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## Extension Ladder Precautions

An extension ladder provides the easiest, most convenient way to reach high areas, but with greater heights come greater chances for more serious injury. The following safety rules apply:

- To extend the ladder, first lay it on the ground with its feet braced. Then raise the top end of the ladder and walk it upright hand over hand. Once the ladder is nearly vertical, grab a rung at about thigh-high, lift the ladder slightly, and walk its base back away from the house.
- Once the ladder is in position, grab the rope and raise the telescopic section of the ladder, known as the fly, to the desired height. Be sure that both rung hooks lock securely onto a rung of the ladder, then tie off the end of the rope to a lower rung.
- To set the proper ladder angle, use a 1:4 ratio: Divide the ladder height by 4, then move the ladder base that far from the building. For example, if the ladder is 16 feet tall, its base should be 4 feet away from the building.
- Both ladder feet should sit firmly on the ground.
- Never stand an extension ladder on wet, muddy, icy, or snow-covered surfaces.
- Don't stand higher than the fourth rung from the top.
- Never set up a ladder anywhere near electrical power lines.
- Always face the ladder when ascending and descending. Use both hands to grab the rungs—not the rails.
- If necessary, wear a tool belt or holster to carry tools and supplies. That way, you'll have both hands free when climbing up and down.
- As with a stepladder, keep your hips within the vertical side rails. Don't overreach to the left or right.
- When climbing to the roof, the top of the ladder must extend at least 3 feet above the point of contact. When you reach the edge of the roof, grab the top of the rails with both hands, then carefully step around the ladder.

**Take this quiz to see if you know proper ladder safety:**

### True or False

1. You should stand on the top three rungs of a straight or extension ladder.
2. The four-to-one rule should be applied when leaning a ladder against an object.
3. Keep the body centered between the rails of the ladder.
4. It is a good idea to use a ladder in windy conditions.
5. A wood ladder is safe to use if it has cracks and split but doesn't have any missing rungs.

## Answer Key

F.2.F.4.T.3.T.2.F.1



## 7 Energy Management & Saving Tips for Businesses



by  
**John Attala**

To learn more, visit  
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It's an exciting time to be both alive and *in business*. While some technologies are disrupting certain businesses, others are bringing new (sometimes unimaginable) efficiencies and cost savings to them, and others still are creating entirely new industries altogether.

Just consider that the same man who used the world's most powerful rocket to put an *electric sports car* into orbit somewhere between Mars and the asteroid belt also recently struck a deal to give 50,000 Australian homes solar power through a decentralized electric grid at "*no cost to residents*." Meanwhile, India and China seem to be in an unofficial race to boast the largest solar farm, with China even building a *floating one* on top of a deserted coal mine. Indeed, it seems like the days of dirty, expensive energy are drastically numbered.

Of course, leaps in energy technology aren't the only way businesses stand to increase output and reduce costs in the very near future. From business process monitoring to blockchain and security, the Internet of Things for business (IoT) is making possible new efficiencies that would've seemed like science fiction only a few years ago.

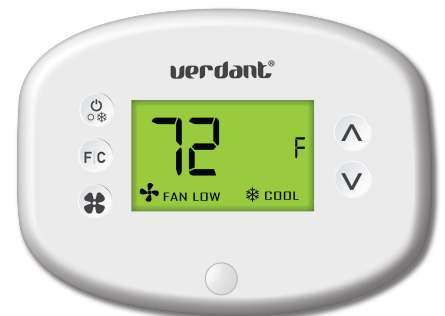


Credit: Elon Musk Instagram

And you don't have to be Elon Musk, Alan Turing, or Nikola Tesla to start reaping the energy saving benefits of new technologies. Indeed, while many are already being implemented by businesses across industries, others are even approaching a tipping point in their adoption where they'll become standard best practice in energy management.

### 1. Smart Climate Control

If there's any energy need that all hotels share in common, it's climate control. Whether it's air conditioning or heating, everyone has the need for some kind of climate control, and often a dedicated HVAC system. From smart thermostats that allow users to program their energy consumption around daily occupancy needs, to smart sensors that monitor fluctuations in real-time occupancy, there are no shortage of energy management tools available to help you save on energy costs.



Indeed, many larger facilities like hotels, schools and other businesses even employ smart energy management systems to maximize their energy savings. Energy management systems like these use sophisticated machine learning algorithms and diverse data sets such as historical thermodynamics, local weather patterns, and peak demand loads to optimize energy consumption in real-time, all year round.

## 2. Air Source Heat Pumps

Smart Thermostats aren't the only way to save on heating costs. Advances in HVAC hardware technology also offer new opportunities to save on energy costs.

Specifically, Air Source Heat Pumps (ASHPs) make it possible to transfer heat from outside a building to inside it (or vice versa). The science behind ASHPs involves using the principles of vapor compression-refrigeration to absorb heat from one place and release it to another. But the advantage for businesses is that ASHPs can be used as energy efficient space heaters or coolers, removing the need to overload a central HVAC system to accommodate the specific needs of a smaller or compartmental space.

## 3. Smart Lighting Technology

Smart energy management systems are not limited only to HVAC systems. Smart Lighting technology also allow businesses to better understand their energy needs, automates energy consumption, and adapt to real-time to changes in occupancy. Indeed, some companies have managed to cut energy costs by 75% and improve productivity by 20% by converting to a smart LED lighting system. Essentially, similar to how an energy management system adjusts energy consumption based on real-time climate control needs, smart lighting systems set preferred lighting times and track activity to improve workflow throughout the facility.

## 4. Solar Panel Technology

Rising economic superpowers and Australian suburbanites aren't the only ones benefiting from the rise and proliferation in solar technology. Hotels both large and small are also embracing increasingly affordable photovoltaic technology to reduce their energy costs.

Indeed, solar power technology offers businesses a two-fold opportunity: to (1) reduce their energy consumption from the grid, and (2) even sell any excess production back into that grid. So not only are businesses able to save on their energy costs, but possibly even subsidize whatever energy consumption they still have to pay for.

## 5. Automatic Shutdown Sockets

A significant energy cost for many businesses is vampire power draw. Also known as standby power, it "refers to the way electric power is consumed by electronic and electrical appliances while they are switched off (but are designed to draw some power) or in a standby mode."

**This is where Automatic Shutdown Sockets come in.** These are simply smart power outlets that use either infrared sensors or timers to cut power to any connected device when the device is not in use or the room is unoccupied. In other words, they save energy on powering devices whenever they are not in use.



## 6. Predictive Monitoring

Just as smart energy management systems allow businesses to monitor, track, and optimize their energy consumption, Predictive Maintenance allows them to use sensor data to identify wasteful or hazardous trends and alert maintenance staff before the issue escalates into a much more costly one. For example, as an HVAC systems fluctuates through different levels of performance based around occupancy needs, there will be more or less wear-and-tear on its different physical components. So rather than waiting for a component to break down before being serviced or replaced, predictive maintenance allows engineering staff to predict maintenance needs based on system usage, prevent system failures, and reduce the costs of operating a faulty system.

Verdant's online management platform, for instance, continuously collects data related to HVAC runtimes for each unique room and assigns them efficiency ratings. This rating is an indicator of how quickly a room can be heated or cooled back to the guest's preferred temperature and provides engineering teams with critical alerts when HVAC equipment is in need of attention.

## 7. Smart Water Management

Just as water is a necessary condition for life as we know it, every business relies on the stuff just to keep afloat. Indeed, whether it's part of a manufacturing process or necessary to provide guests with food, drink, and sanitary facilities, dihydrogen monoxide (H<sub>2</sub>O) seems to be an unavoidable cost of doing business.

Now, when considering how a single leaky toilet can cost as much as \$840/year *plus* the costs of any additional water damage, it's easy to see how water can become an unnecessarily expensive business expense. By monitoring water lines with smart, low-cost water meters, however, facilities such as hotels and college campuses can see an ROI on their water consumption in less than 5 years.

## Energy Savings: The Final Frontier

As technology advances, it changes many of our tastes, preferences, and needs. It relegates old industries obsolete, creates new ones seemingly overnight, and fundamentally shifts the balance of supply-and-demand across markets. **What doesn't change is the need for energy consumption.** Whether it's manufacturing physical products, providing guests with a comfortable experience, or keeping employees happy, productive, and motivated, energy consumption is a universal cost of doing business. For businesses willing to embrace the advance of technology, however, there are no shortage of opportunities to reduce their energy costs. The exact mix of energy saving technology that's right for any given business will depend largely on industry, location, and even customer preferences. But the one thing that *is* universal is that the businesses that do leverage technology to save on their energy costs will be ultimately more profitable, and better able to adapt to the ever-changing technological landscape.



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