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# BOA
## Building Operators Association of Canada

**Official Publication of the Building Operators Association (Calgary)**

**June 2025**

# What's Inside?



**Front Cover: Riley Halvorsen**

# Important Phone Numbers

| | |
|---|---|
| Emergency | 911 |
| Alberta Boiler Safety Association | 403 291 7070 |
| Alberta Labour (Emergency) | 403 297 2222 |
| Buried Utility Locations | 1 800 242 3447 |
| City Of Calgary (All Departments) | 311 |
| Dangerous Goods Incidents | 1 800 272 9600 |
| Environmental Emergency | 1 800 222 6514 |
| Poison Centre | 403 670 1414 |
| Weather Information (24hr) | 403 299 7878 |

# Executive & Committees

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|---|---|
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| Webmaster<br>Les Anderson | webmaster@boacalgary.com |

Countdown To:

Fathers Day

15th June 2025

# President's Message

## I hope this message finds you & yours well and in good health

Our last meeting at the Danish Canadian Club was May 13th, The Danish Canadian Club will close their doors on May 31, 2025. We have been at that spot educating Building Operators for the last 20 years, man, that has been a long run. June is the end of the year for us. BOA reconvenes in two months, and our next meeting will be September 9th yet, we still do not have a venue to hold our future meetings. We are still searching for a new home that offers a similar deal as we had at the DCC including the ability to hold Trade Shows. A change can be a good thing. No matter what, we will continue with the magazine. The Executive will put together a game plan for the new year.

In other news, PanGlobal Training Systems, the publisher of Power Engineering books used by Building Operators for courses and certification, is also closing at the end of June. It is unclear which company will provide educational material for the Building Operators moving forward. I can only hope it will be a little more up to date with relevant standards; some of the material we have been learning from was new in 1970. I will hope to be attending the IPECC conference in Calgary from June 15th to 17th to find out the next steps we need to take and report back to you the findings.

I would like to say thank you to everyone at the Danish Canadian Club for all the help over the last 20 years. Both Peter and Eva have gone the extra mile in helping us to provide to you great meetings and the marvelous Trade Shows.

Thanks to all our Associates who have supported us over the years and helped us in our continued commitment to the Building Operators. Our commitment which will not waiver, of continued education, safety at the worksite and ongoing support with their careers.

Have a great Summer, be safe and see you in September.

Warm regards,

***Les Anderson***


# TEST YOUR OPERATOR IQ!

**Are you equally adept at troubleshooting problems in the boardroom and the boiler room? As the resident facility guru, there's a lot riding on whether or not you know the difference between sounds control and a sound investment.**

**Try our monthly Operator IQ challenge...*answers on page 33***

**1) Starting, stopping or unloading of the compressor is usually done by all of the following operating controls except:**

a. temperature actuated control
b. viscosity activated control
c. pressure activated control
d. humidity activated control
e. all of the above can control the starting, stopping or unloading of the compressor

**2) The operating control which uses a bimetal element is a:**

a. fluid expansion actuating control
b. pressure actuated control
c. humidity actuated control
d. temperature actuated control
e. solenoid actuated control

**3) The safety control which uses a current transformer with a resistor in the motor circuit is known as:**

a. high motor temperature cutup
b. low oil sump temperature protection
c. motor overload protection
d. solenoid valve
e. high oil temperature cutout

**4) One of the following actuating control valves is electromagnetically operated:**

a. thermostat valve
b. fluid expansion regulator valve
c. evaporator pressure regulating valve
d. condenser cooling water regulating valve
e. solenoid valve

**5) With regard to the high side, the maximum setting for a pressure limiting device on a refrigeration system shall not exceed the pressure relief device by:**

a. 100 percent
b. 75 percent
c. 90 percent
d. 80 percent
e. 50 percent

# Benefits Of Power Quality Assessment For Commercial & Industrial Environments

Mohsen Abedi P.Eng, PSM.Eng


**Power quality assessment is crucial for commercial and industrial environments due to the following reasons:**

1. **Equipment Sensitivity:** Commercial and industrial facilities often use sensitive electronic equipment and machinery. Power quality issues, such as voltage fluctuations, harmonic distortions, and interruptions, can adversely affect the performance and reliability of these devices.

2. **Production Efficiency:** In industrial settings, even minor disruptions in power quality can lead to production inefficiencies and downtime. Power quality assessments help identify and rectify issues that could impact the smooth operation of manufacturing processes.

3. **Equipment Longevity:** Industrial equipment is often expensive and designed for a specific operational environment. Poor power quality can lead to premature aging and failure of equipment, resulting in costly replacements. Regular assessments help extend the lifespan of machinery and reduce the overall cost of ownership.

4. **Data Integrity:** Many commercial and industrial processes rely on computer systems for data collection, monitoring, and control. Power quality issues can lead to data corruption, loss, or system failures. Assessments ensure the reliability and integrity of data, which is crucial for decision-making and quality control.

5. **Compliance with Standards:** Commercial and industrial facilities are subject to various standards and regulations related to power quality. Compliance with these standards is essential to avoid penalties, legal issues, and to maintain a safe working environment.

6. **Energy Efficiency:** Poor power quality can result in energy wastage and increased

operational costs. By identifying and rectifying power quality issues, commercial and industrial facilities can improve energy efficiency, leading to cost savings over time.

7. **Financial Impact:** Downtime and equipment failures in commercial and industrial environments can have significant financial implications. Power quality assessments help prevent such issues, ensuring continuous and reliable operation.

8. **Improved Equipment Performance:** Power quality assessments can identify and address issues that might degrade the performance of sensitive equipment. This leads to consistent and reliable performance, ensuring that equipment operates at its designed capacity.

9. **Diagnostic Capability:** Power quality monitoring provides valuable data for diagnosing the root causes of issues. This information is essential for implementing targeted solutions and preventing recurring problems.

10. **Insurance and Liability:** Insurance providers may require proof of power quality measures to mitigate risks associated with equipment damage or business interruption. Assessments help in providing evidence of proactive measures, potentially reducing insurance premiums.

11. **Proactive Problem Identification:** Regular assessments provide a proactive approach to identify potential power quality issues before they escalate. This allows for timely corrective measures, preventing more extensive problems and minimizing the need for emergency repairs.

12. **Cost Savings:** By preventing equipment failures, reducing downtime, and improving energy efficiency, power quality assessments contribute to overall cost savings for businesses. This includes savings on repair and maintenance costs and potential insurance premium reductions.

In summary, power quality assessment is essential for commercial and industrial environments to ensure the reliable and efficient operation of equipment, maintain compliance with standards, and mitigate financial and operational risks. It is a proactive approach that contributes to the overall success and sustainability of businesses in these sectors.

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# How Quality Audits Drive Productivity & Improve Work Standards in Facility Management

Juan Carlos LaGuardia Merchán


As a facility manager, I've seen countless strategies deployed to boost productivity and enhance work quality. While many have merit, one approach consistently stands out for its transformative impact: **quality audits**.

When executed correctly, quality audits are far more than a checklist exercise or a box-ticking activity. They are a robust tool that can revolutionise the way facilities are managed, fostering a culture of continuous improvement and efficiency. Today, I want to share my insights into how quality audits can dramatically enhance productivity and raise work standards across facility management teams.

**The Misunderstood Nature of Quality Audits**

Let's be honest: the mention of an audit often triggers sighs and furrowed brows among staff. It's viewed as invasive, time-consuming, or even punitive. But this perception couldn't be further from the truth if audits are done with the right intent.

A well-implemented quality audit isn't about assigning blame or pointing fingers. It's about **establishing benchmarks**, identifying areas of improvement, and celebrating successes. It creates an opportunity for reflection and alignment, making sure every member of the team understands how their role contributes to the broader organisational goals.

**The Link Between Audits and Productivity**

Here's where it gets interesting: **quality audits directly impact productivity** in ways that aren't always obvious at first glance.

1. **Clarity of Roles and Processes**: A quality audit helps uncover inefficiencies in workflows and eliminates redundancies.

When roles and processes are clarified, team members spend less time second-guessing their responsibilities and more time focusing on high-value tasks.

2. **Proactive Maintenance**: Facilities often operate on the philosophy of **"if it's not broken, don't fix it."** However, audits help identify potential issues before they escalate into costly emergencies. Proactive maintenance ensures smoother operations, fewer disruptions, and ultimately, a more productive team.

3. **Data-Driven Decision Making**: During audits, data is collected and analysed, providing actionable insights into operational trends. These insights empower managers to make informed decisions, optimise resource allocation, and address inefficiencies with precision.

**Team Accountability**: Regular audits foster accountability by creating transparency. When team members know their work is reviewed against measurable standards, they're more likely to take ownership of their responsibilities, leading to improved performance across the board.

**Elevating the Quality of Work**

Beyond productivity, quality audits have a profound impact on the standards of work delivered. Here's how:


1. **Skill Development**: Audits often highlight training gaps among team members. Addressing these gaps through targeted training enhances the skills and confidence of the workforce, which in turn improves the quality of work.

2. **Consistency in Operations**: One of the biggest challenges in facility management is ensuring consistent service delivery. Audits establish and reinforce standard operating procedures (SOPs), reducing variability and ensuring a uniformly high standard of work.

3. **Improved Safety Compliance**: A significant aspect of any quality audit is evaluating safety practices. By identifying risks and ensuring compliance with safety regulations, audits contribute to a safer working environment, a cornerstone of quality work.

4. **Enhanced Client Satisfaction**: Let's not forget the end user: the building occupants, tenants, or clients. When audits improve internal processes, the ripple effect is felt by those we serve. Better-maintained facilities and more efficient operations translate into higher client satisfaction and retention rates.

**My Personal Experience with Quality Audits**

One example that stands out from my career involved a multi-site facility management contract for a corporate client. Before implementing routine quality audits, the team faced persistent challenges, miscommunications between shifts missed maintenance deadlines, and dissatisfied occupants.

Introducing bi-monthly audits was a game-changer. We began by focusing on key

performance metrics, such as equipment uptime, task completion rates, and tenant satisfaction scores. The audit process exposed bottlenecks, such as delayed information sharing between day and night shifts, which we resolved by implementing a digital task management system.

Over the course of a year, **productivity increased by 25%, maintenance costs dropped by 18%**, and tenant satisfaction scores rose to an all-time high. The audits weren't about pointing out flaws but about discovering ways to work smarter, not harder.

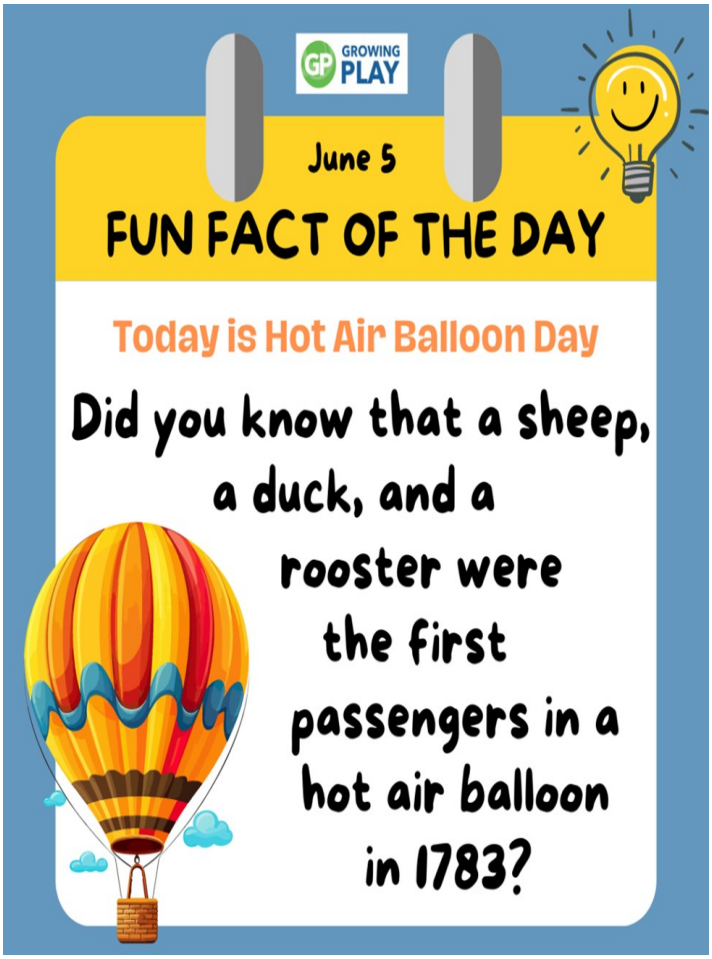
**Tips for Successful Quality Audits in Facility Management**

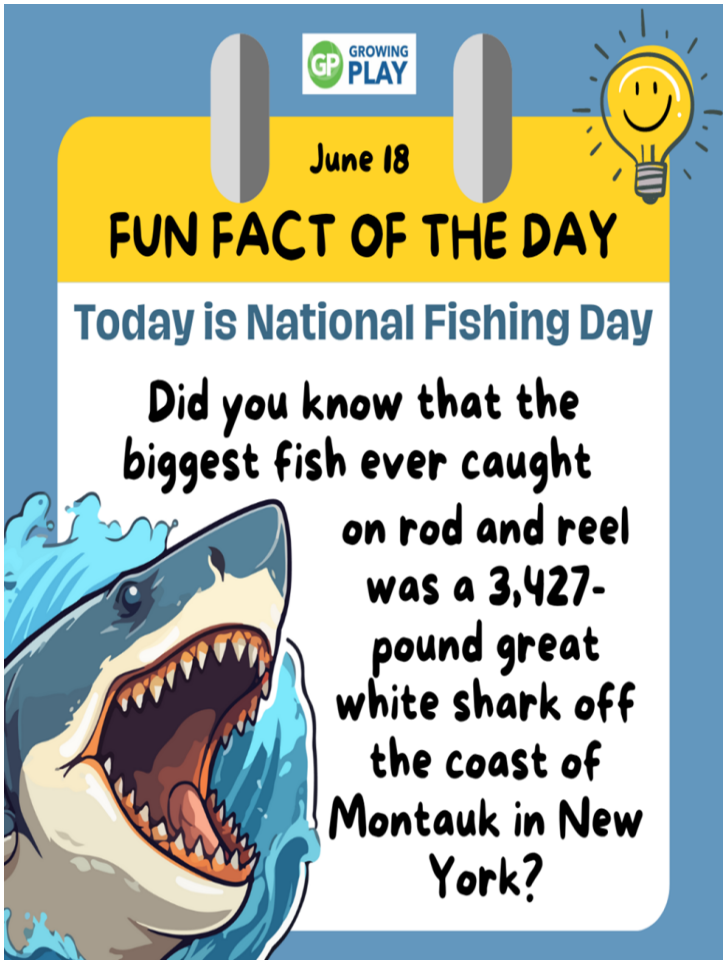
1. **Involve Your Team**: Make audits a collaborative effort. When team members participate, they're more likely to embrace the findings and implement changes.
2. **Focus on Solutions, Not Problems**: Frame audit results as opportunities for growth rather than criticisms.
3. **Leverage Technology**: Use audit software to streamline the process, collect data, and track improvements over time.
4. **Follow-up**: An audit is only as good as the actions it inspires. Ensure there's a follow-up plan to implement recommendations and measure results.

**If you're ready to unlock the full potential of your team and elevate your facility's operations, start by implementing regular quality audits. The rewards in productivity, quality, and satisfaction are well worth the effort.**

*Article reprinted with permission*

# KEEP CALM AND SEE YOU IN SEPTEMBER



# Hazmat Management: Tools of the Trade

**The right combination of containers, shelving, labels and protective equipment can keep workers and facilities safe**

Managing hazardous materials and chemicals can be daunting, in part because of the large array of such materials within many institutional and commercial facilities. Managing these materials often becomes easier when managers take inventory of hazardous materials and chemicals and understand the dangers and regulatory requirements that apply to them.

Equally important, however, is having the equipment and supplies to successfully implement the management plan and, ultimately, provide a safer workplace.

**Inventory chemicals**

Typical hazardous materials and chemicals that should be accounted for include mercury-containing equipment, lubricants, fuels, paints, glues, adhesives, compressed gases, cleaning solvents, laboratory chemicals, batteries, pesticides, coolants and refrigerants.

A hazardous materials and chemical management program can help managers and staffs store and handle these products safely and efficiently. In addition to having an accurate inventory of all materials, essential components of a management program include conducting periodic inspections, using proper containers and storage, and planning for emergencies.

Taking inventory starts with a department-by-department, room-by-room inspection to identify mercury-containing instruments, radioactive materials, solutions, chemicals, gas cylinders, pesticides, refrigerants, and unlabeled containers containing chemicals. Managers should develop a computerized inventory using either a spreadsheet or chemical inventory software, which allows for a more powerful analysis and easier way of tracking inventory. Software can help manage material safety data sheets, databases of regulated substances, and regulatory-compliance tasks.

Workers conducting the inventory should record the name of each chemical or product, its container size, quantity, locations, solution concentration or strength, expiration dates, frequency of product use, and whether an item must be disposed. They also should record information required for the National Fire Protection Association (NFPA) and the Hazardous Material Identification System (HMIS).

The inventory process runs more smoothly when at least two people work together. One reads the information from the container while the other records it on the data-entry form. The inventory also can serve as an inspection of equipment and storage systems.

Managers can expand the inventory to evaluate such components as safety showers, eyewash stations, fire extinguishers, fire blankets, chemical-resistant gloves, chemical-resistant aprons and suits, goggles and face shields, respirators, first-aid materials, spill-management materials — such as absorbents and specialty spill kits — containers, labeling, shelving, and storage facilities.

Many older laboratories and chemical work areas have products containing asbestos. Taking inventory offers an opportunity to document suspect materials, such as fire blankets, fume-hood linings, workbenches, Bunsen burner pads, and bottoms of drawers and cabinets. Abatement contractors should replace products that are worn or damaged.

Before performing a site inventory, managers should make sure inspectors have appropriate protective equipment. The minimum protective equipment includes nitrile gloves, chemical-splash goggles, and protective clothing, including long-sleeve shirts, lab coats and long pants.

**Containers and labels**

The chemical inventory should ensure that all containers are properly labeled and that all labels are intact according to the applicable regulations.

Inspectors should repair any damaged labels and mark unmarked containers with the chemical name fully spelled out with no chemical formulas; the concentration; the date received or made up; and NFPA or HMIS symbols and information.

Chemical-supply companies and other providers sell software used to generate new labels. Managers also can buy blank HMIS labels, which provide prompts for documenting correct label information. Be sure to use labels and marking pens that are colorfast and permanent and to cover labels with clear packing tape for protection.

The inventory also should evaluate the condition and appropriate use of containers. Inspectors should look for unstable and compromised chemicals, corroded or unstable containers, sagging cabinets, and corroded shelving and supports.

Flammable materials require special attention. Managers and inspectors should be aware of the locations and quantities of flammable products and waste. Local regulations dictate the way organizations store, dispense and use flammable materials, as well as the types of storage equipment and emergency-response systems that should be used. Regulations typically dictate the type of equipment, supplies, signage, and communication systems to be used.

Check to see, too, if local regulations govern the storage of corrosive and oxidizing materials.

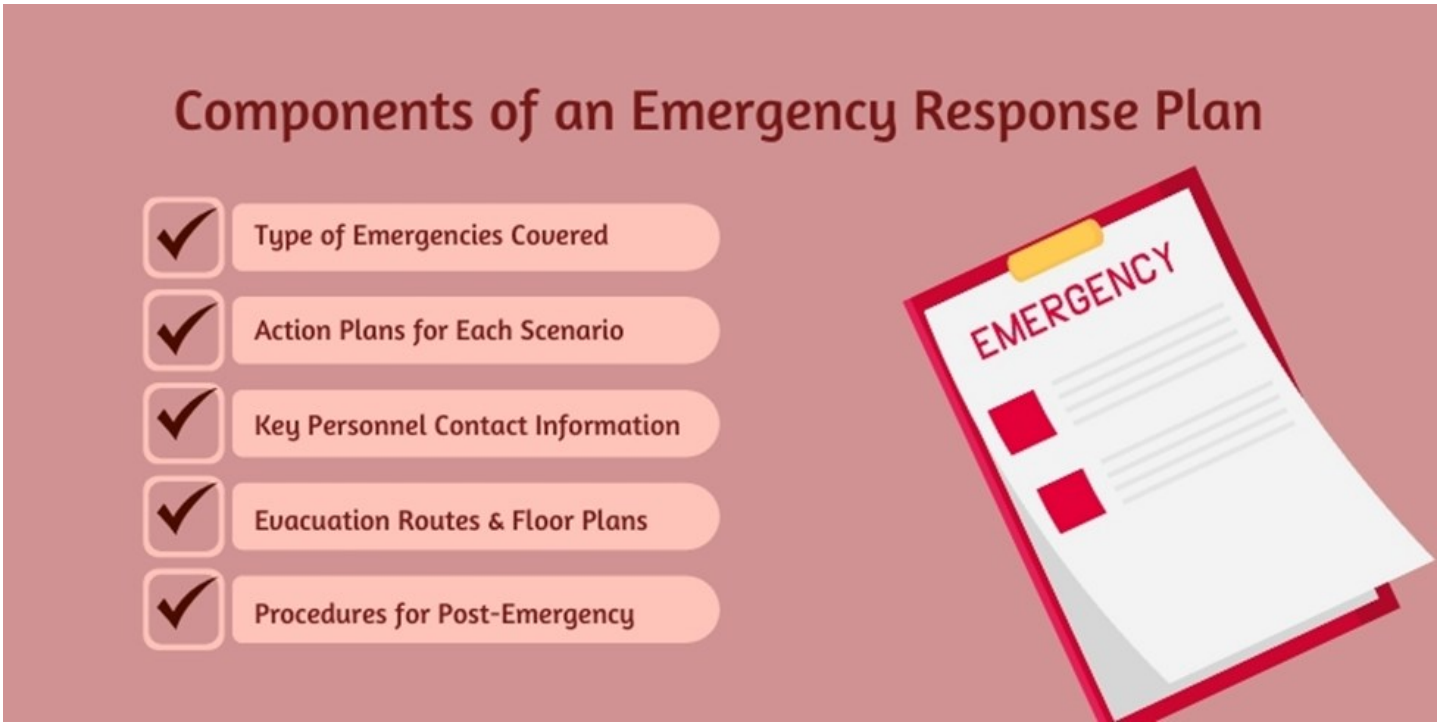

**Storage considerations**

Improper storage practices can increase the risks associated with hazardous chemicals, particularly those that are flammable, corrosive or reactive. Separate and store products in compatible categories using the proper equipment stored on compatible shelving. Examples of materials to store separately include:

- Corrosive acids with pH less than 2.5, including hydrochloric and phosphoric acid, which are found in toilet cleaners, battery acid, sulfuric acid in drain cleaners, nitric acid for etching, and acetic acid for photography stop baths. Storage cabinets for these materials should be labeled “Acid.”
- Corrosive bases with pH greater than 12.5, including ammonia, sodium hydroxide, found in oven cleaners, some automatic dishwashing products, and photography developer. These cabinets should be labeled “Corrosive.”
- Oxidizers, including bleach, pool chemicals, concentrated nitric acid, concentrated sulfuric acid, chlorates, nitrates, nitrites, perchlorates, peroxides, sodium hypochlorite, and ammonium persulfate, found in photography reducing solutions. Cabinets with these materials should be labeled “Oxidizer.”
- Flammable materials, including non-chlorinated solvents and solvent-based products; alcohol- and solvent-based cleaning products; butoxyethanol, found in all-purpose cleaners, carpet spotters and glass cleaners; carburetor cleaners; disinfectants; and paints and glazes with heavy metals. Cabinets should be labeled “Flammable.”
- Oil and solvent-soaked rags, which can self-ignite and should not be mixed with other wastes or combustible materials. Special containers for these rags can prevent fires.

**Shelving solutions**

Managers can select from different types of shelving products and systems designed for chemical storage. Reviewing relevant features before selecting equipment can help ensure compatibility of the stored chemicals. Managers also should check with chemical suppliers about the types of shelving and equipment that meet a department’s needs.




In selecting shelving, managers first should consider general issues. For example, shelves should be no more than 12 inches deep, should not use non-porous surfaces, should have fasteners made of corrosion-resistant materials, and should not have steel or iron nails or brackets that can rust. Supports also should be strong enough to withstand the anticipated load.

Second, managers should consider shelving materials. Plywood shelving, not particleboard or veneer, is appropriate for corrosive materials and other chemicals, such as non-oxidizers and non-flammables. But plywood is not appropriate for oxidizers and flammable materials, which could ignite the shelves. If plywood is the only option, oxidizers should be placed in a plastic tub before begin stored on a shelf.

Managers should specify metal shelving for storing flammable materials but not for corrosives, unless the shelving has an epoxy or chemical-resistant finish. For materials such as composite or plastic shelving — not Formica — managers should check with chemical product suppliers for compatibility.

Third, managers should consider specifying an anti-fall mechanism at the shelf edge, such as a lip, trough or guardrail. New shelves usually feature a trough or lip already attached. For existing shelving, managers can specify a chemical-resistant, 2-inch shelf lip or 1 ½-by-¼-inch wood furring strips, wood molding or plexiglass strips. Workers should secure the lip onto the shelf with a nail because adhesives can react with spilled chemicals.

This simple addition to existing shelves can prevent containers from falling and causing problems. But lips will not completely prevent spills from dripping over the edge, so managers should require that workers contain liquids by encasing the containers in a plastic tub or transferring the liquids to safety bottles.

**Emergency response plans**

Finally, a proper emergency response plan requires that departments have appropriate response supplies and equipment. Managers should review chemical and hazardous-material storage areas to ensure workers have access to appropriate emergency response equipment, such as a fire extinguisher designed for the chemicals stored, an eyewash station or emergency shower, and chemical spill kits and absorbent materials.

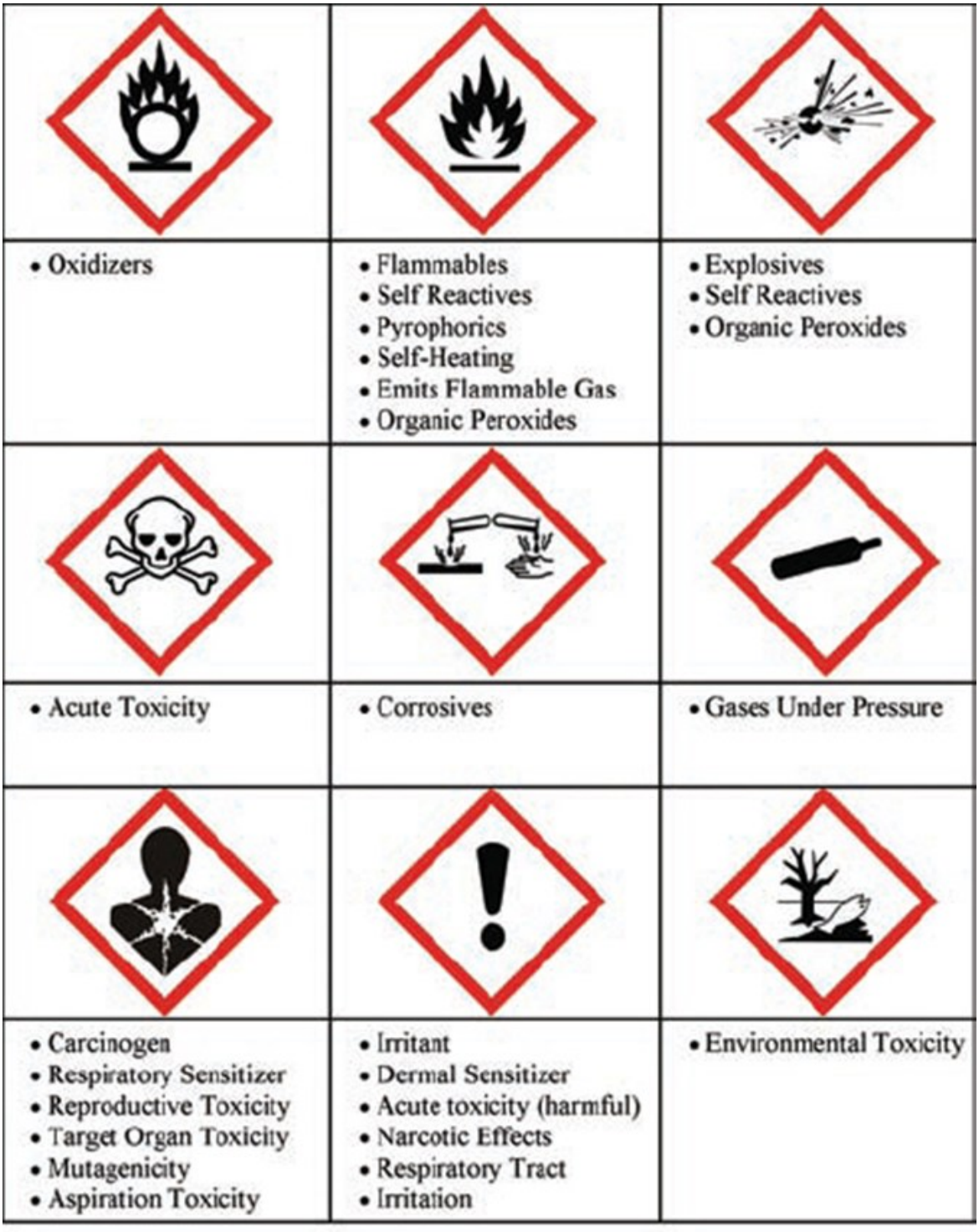
Emergency equipment should be readily available wherever chemicals are present. Workers should use these supplies and equipment in conjunction with an emergency response plan to prepare for and handle chemical spills and accidents.

**Hazmat research resources**

Dangers associated with chemicals and hazardous materials can be difficult to assess, and understanding the regulatory requirements that can apply to these products often adds a layer of complexity to the challenge.

Earlier this summer, the Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency (EPA) jointly developed the Occupational Chemical Database — www.osha.gov/web/dep/chemicaldata — as a reference for maintenance and engineering managers seeking information about the chemicals and hazardous materials in their facilities.

This database compiles information from several government agencies and organizations. Many commercially available chemical-inventory programs can provide similar information.




The hazards and regulations on the storage of ammonia refrigerants require that managers pay extra attention to several safety considerations, such as special personal protective equipment, training, signs, labels, inspections, and emergency-response issues.

OSHA has a web page that contains interactive information for safe storage and use of refrigerants.

Managers can access this information, including a customizable safety checklist, at www.osha.gov.

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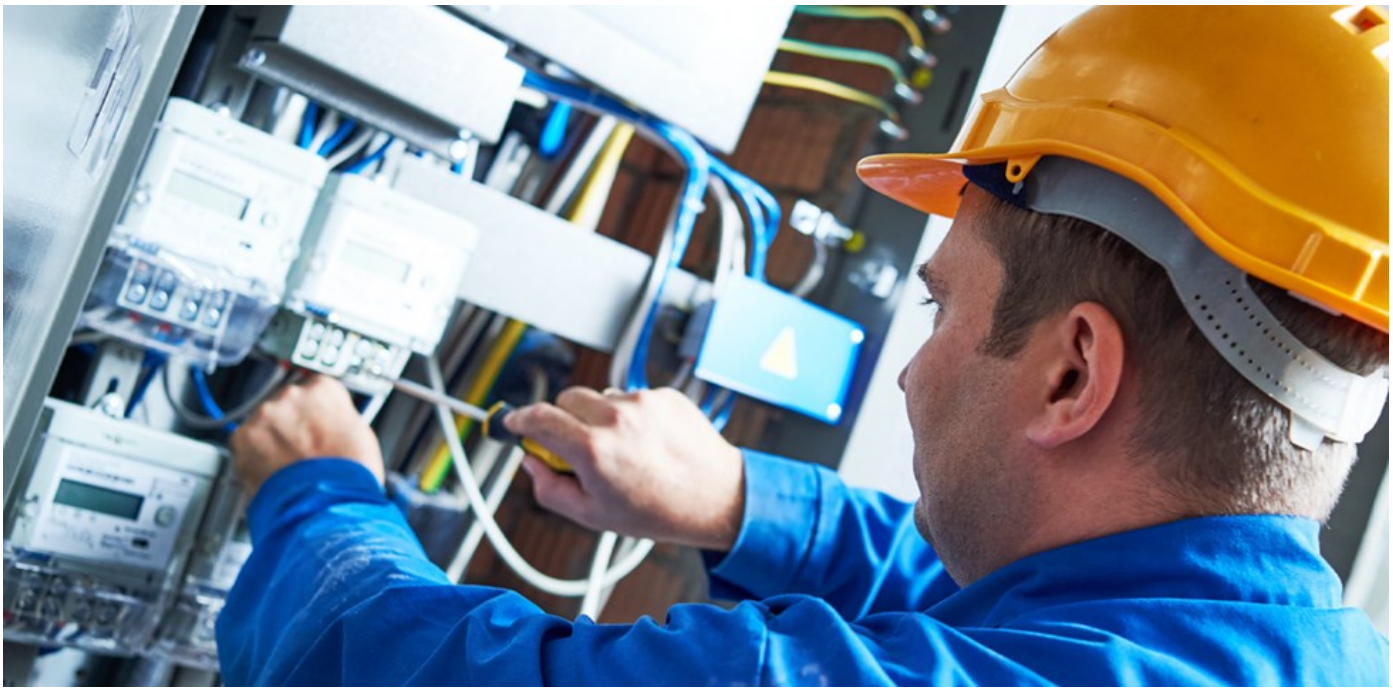
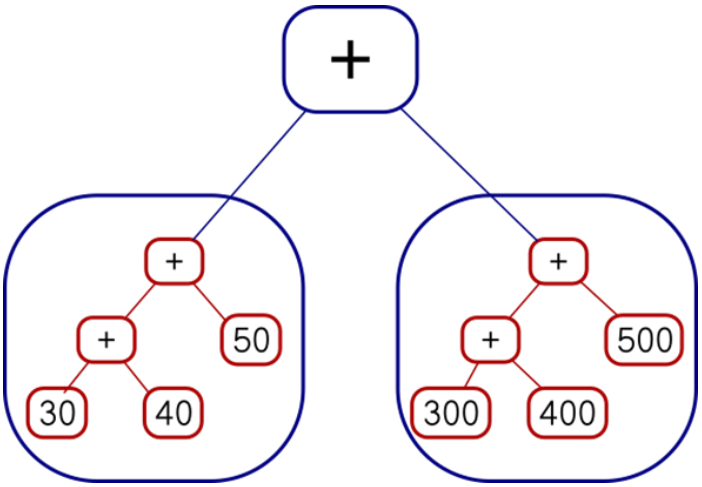
# HVAC Retrofits: 8 Factors Leading Facility Executives To The Best Choices



No matter how well an HVAC system is maintained, it will eventually need to be replaced. That isn't a task to be entered into lightly. HVAC system replacement is a costly and messy process that can disrupt building operations over an extended period of time. That means it's crucial to ensure that the retrofit produces the maximum benefit. Not only will this enhance the operation of the facility, it will also help to ensure that the retrofit process will not have to be repeated in the near future.




Facility executives embarking on an HVAC retrofit should keep eight steps in mind.

**1. In-kind replacement**

The easiest and quickest way to replace an older HVAC system is to put in a new system that matches the old one. For example, when the building chiller reaches the end of its service life, it is common practice to install a new chiller of the same type and capacity. But conditions today are probably different, perhaps vastly different, than they were when the original chiller was installed.

While that approach is simple and quick, it is often not the best choice. Most HVAC systems and their components have normal service lives of 15 to 25 years if properly maintained. When a system is originally installed, it is sized and designed to meet the needs of the building at that time. But buildings change, and so do the operations that take place within the buildings. There might be more people in the building and more electronic equipment — computers, printers, copiers and the like. Simply

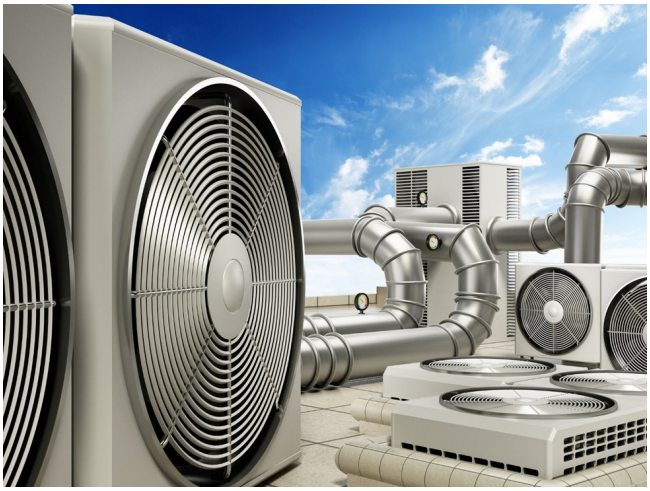
replacing in kind does not take these changes into consideration. To get the most out of HVAC system retrofits, the new system with new options must be designed to match the current needs of the facility.

**2. New Technologies**

HVAC technology has achieved tremendous progress in the past 15 years. New DDC control systems provide a better climate while reducing energy costs. High-efficiency or alternative-fuel chillers can reduce the cost of air conditioning. Variable frequency drives can improve the operating efficiency of both chillers and fan systems. Interoperable building automation systems give facility executives the tools they need to better manage operations.

Although these HVAC technologies are relatively new, they are not risky. They have proven themselves in a range of applications. They are widely used today in new construction. Many are considered essential to keep facilities competitive.

An HVAC retrofit is often a good time to take advantage of these newer HVAC technologies. To determine which technologies are appropriate and cost-effective for the application, take a close look at the existing facility and how it is operated.



**3. Flexibility**

Buildings today are in a constant state of churn. Interiors are rearranged. Old tenants move out and new ones move in. Infrastructure requirements increase. The result is that facility executives are constantly changing facilities to meet the needs of occupants. But one thing that doesn't change easily in many existing buildings is the HVAC system.

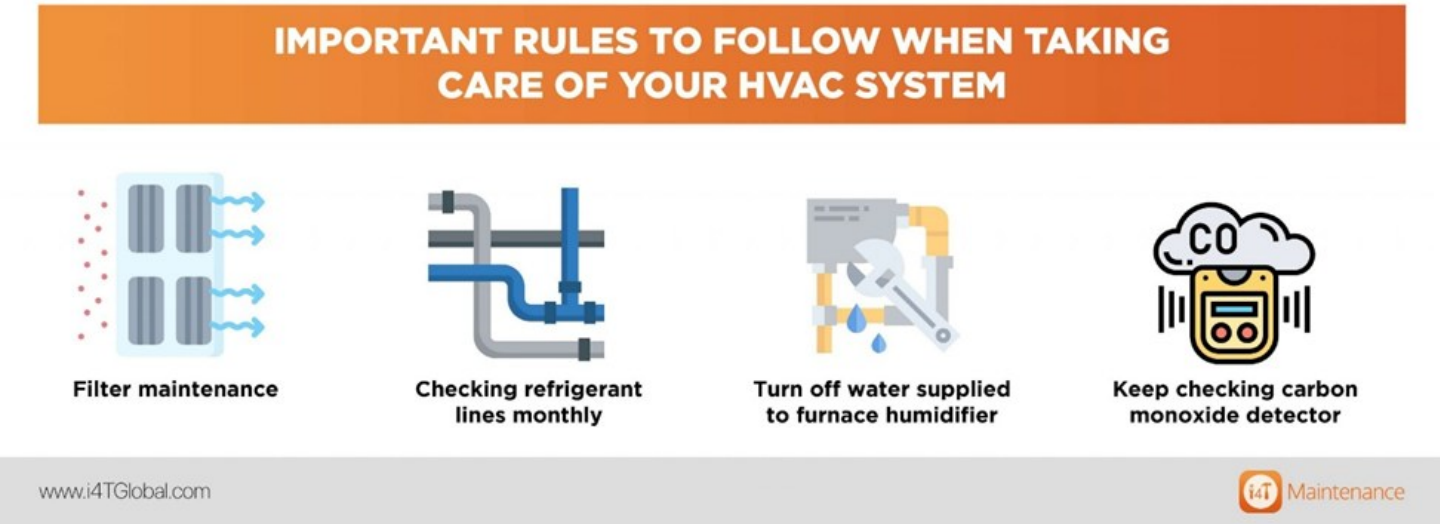
That's why flexibility should be a key goal of HVAC system retrofits. HVAC systems should be able to adapt to those changes without requiring costly alterations. Otherwise, facility executives face a no-win situation: covering the cost of expensive changes to the HVAC system or living with an HVAC system that can't keep up with changes in the building.

**4. Part-load Performance**

Chillers are the single largest users of electricity in practically all buildings. Not surprisingly, improving the efficiency of chillers has been a major goal for chiller manufacturers. As a result, today's chillers are 25 to 50 percent more efficient at full load than those of 15 years ago. When selecting replacement chillers, much emphasis is paid to this full-load efficiency rating. But that's only part of the picture.

Most chillers operate at full load for less than 5 percent of their total run time. The other 95 percent of the time chillers are operating below full-load capabilities. As the load on chillers decreases, so does the efficiency of the units.

Because chillers operate under part-load conditions for such a high percentage of their run times, the annual energy cost of the chiller will be determined primarily by its part-load efficiency. Although it might cost more to purchase a unit with better part-load efficiency, this premium will be recovered many times over through energy savings during the life of the chiller.




**5. Maintenance**

As HVAC systems age, maintenance requirements increase. But maintenance costs are too often ignored when system retrofits are being evaluated. In fact, as long as a system doesn't stop working, it might not even be considered as a retrofit candidate. But just because a system is able to limp along doesn't mean it's operating efficiently or meeting the requirements of the application.

Look through maintenance records for the building. High maintenance costs and increasing maintenance requirements are an indication that those systems or components might be approaching the end of their service lives. Facility executives should set priorities for HVAC retrofits based in part on maintenance requirements.

Another factor to consider is the availability of replacement components. When components for a particular system are no longer available from the manufacturer, or if the manufacturer should go out business, it is only a matter of time before it will be necessary to replace that system. This has happened frequently with building automation systems. Before the development of interoperable systems, users were at the mercy of the system manufacturer. Many manufacturers failed or decided to get out of the building automation system business. Others upgraded their systems and discontinued support for older generation systems. Once the spare parts inventory was depleted, users had little choice but to retrofit their building automation systems.

Consider also the maintenance requirements of the systems and components that are being installed as part of the retrofit. Can they be maintained by in-house personnel, or will their maintenance have to be performed under contract? What tools and training will be required to properly operate and maintain the new system? What are the projected maintenance costs? Ignoring maintenance requirements for the retrofitted system will only guarantee having to retrofit the system before it would otherwise be necessary.

**6. The Big Picture**

There is a tendency when planning for HVAC retrofits to develop tunnel vision and focus on only a specific component or portion of the HVAC system. The chiller that is becoming unreliable or the air handler that no longer meets the needs of the conditioned space might be serious problems that demand to be addressed. But before making retrofit decisions, facility executives should step back and determine if other projects planned for the building will affect HVAC system operation.

For example, upgrading the lighting system or installing more energy-efficient windows will reduce cooling loads. If those projects are planned in the near future, then a planned retrofit program for the building's chiller should be scheduled after they have been completed. Reduced cooling loads will allow a smaller chiller, reducing both first and operating costs.

**7. Building Occupants**

One of the goals of any HVAC retrofit program is to improve the level of service. While facility executives

might understand the technical problems with the existing HVAC systems, they will not fully comprehend the needs of building occupants unless they get them involved in the retrofit process. After all, occupants are the ones that understand their operations the best. Facility executives will not know what system will best meet occupant needs — indeed, they might not even have a good understanding of what their HVAC needs are — but occupant input will give the facility executive a clearer understanding of what the HVAC system will be expected to do.

Building occupants are also good sources of information on the performance of existing systems. Frequently, they are aware of problems that go unreported to building staff. That information is often crucial in setting priorities for HVAC system retrofits.

There's one other good reason to get occupants involved: HVAC system retrofits can be disruptive. They can require temporary relocation of building occupants. Heating or air conditioning service may be disrupted for days or weeks. A schedule of moves and outages will have to be developed. Without the cooperation of occupants, retrofits can turn into scheduling nightmares.

**8. Program Approval**

HVAC retrofits must compete with other programs for funding. Too often, though, facility executives simply submit funding requests with little or no supporting information. As a result, projects fail to win the funding needed to perform a complete retrofit. Instead, components are patched together just to keep the system running.

To increase the chances of receiving funding, facility executives must submit their budget requests in a format familiar to financial managers. Energy savings, maintenance savings, return on investment: These are among the terms that will help convince financial managers of the value of the project.

It's also important to provide the right level of detail. For example, if reliability is an issue, it isn't enough simply to report that fact; instead, the facility executive must show that it is a problem with key supporting information. How many times has service been interrupted? What was the cost of those interruptions to the maintenance department? What was the cost to building occupants? What level of performance can be expected from the retrofit system?

An HVAC retrofit is a major undertaking for the facility department, the occupants and the organization's management. It is also an opportunity — an opportunity that, because of the cost and disruption involved, might not come along again for decades. What's more, the success of the project will shape the way that occupants and top management perceive the facility department — a perception that will influence the success of future facility initiatives. Taking the time to get the retrofit right is worth the effort.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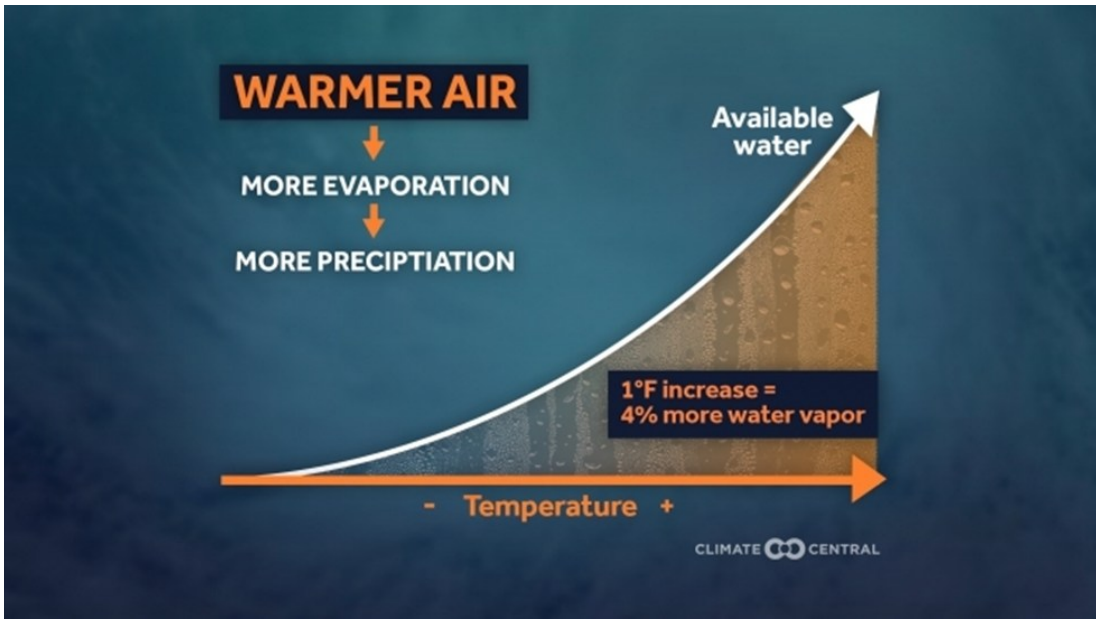
# On HVAC Technology... It's Not the Heat

## Facilities step up humidity control efforts

*by James Piper*



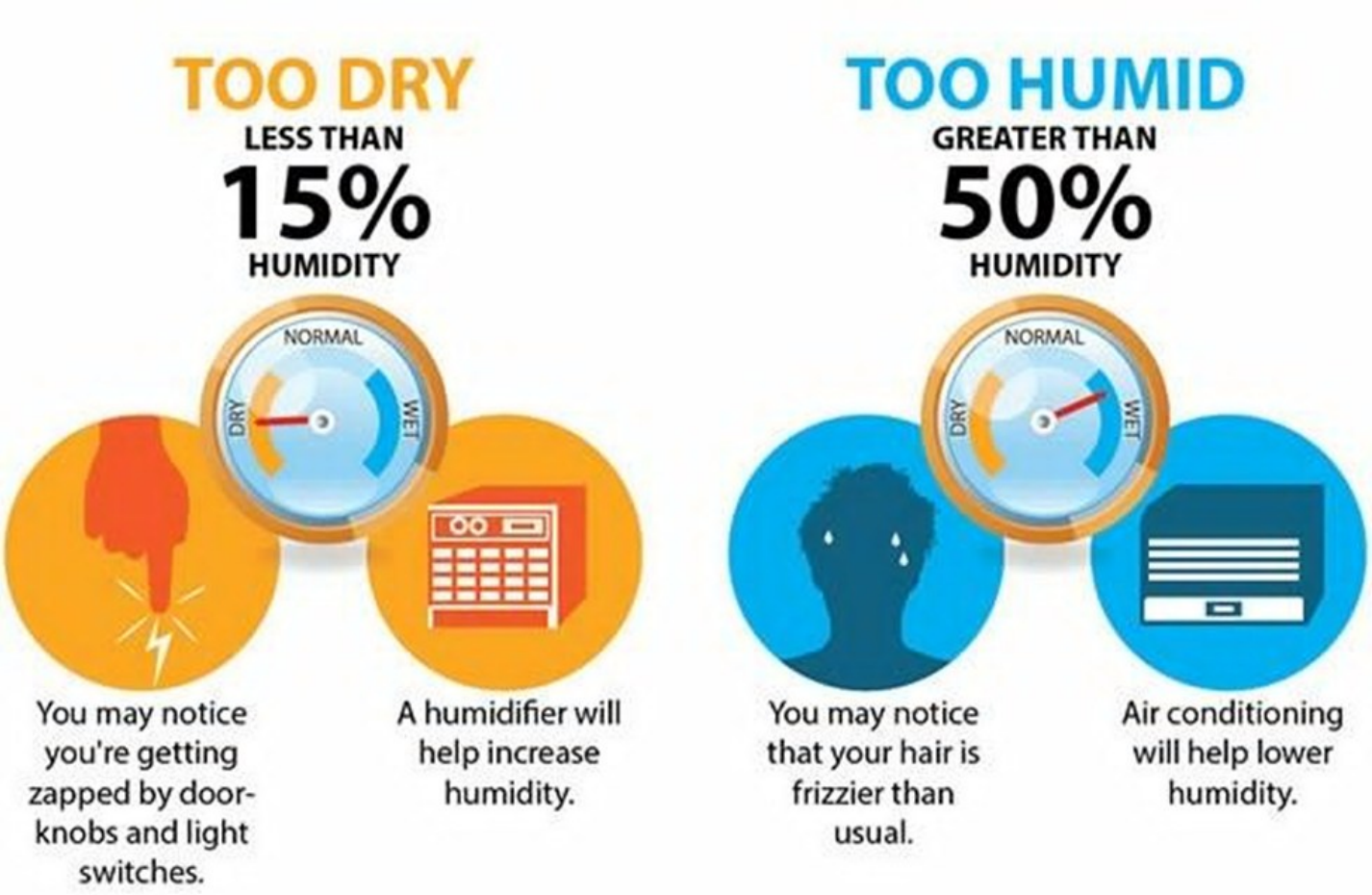

Maintenance and engineering managers are increasingly aware of the important role that proper humidity control plays in indoor air quality (IAQ). In the past, humidity control was limited to special applications, such as computer rooms in which high levels of moisture in the air could corrode electrical contacts and low levels of moisture would lead to a static electricity buildup.

Today, recognizing the effect humidity has on people's health and comfort, more manufacturers are designing HVAC systems with humidity controls. Without proper humidity controls, a typical office facility has summer humidity levels and winter humidity levels that can vary as much as 10- 15 percent.

The ideal summer range for humidity in most applications is 40-60 percent. Higher levels can cause building occupants to feel uncomfortable and can have other effects, such as increasing the number of paper jams in office printers and fax machines. Lower levels can lead to respiratory problems and skin irritation.

During the winter, the ideal humidity range is 20-30 percent. Higher levels can cause condensation to form on windows and other cold surfaces, while lower levels can increase the susceptibility of occupants to colds and viral infections and result in the buildup of static electricity that can damage computers and other office equipment.

The good news for managers is that both summer and winter humidity levels can be easily controlled. A range of options is available - including those that use hot water, steam or electricity - to add moisture to building air




systems. Similarly, building dehumidification systems can use either mechanical refrigeration or a desiccant to remove moisture from the building air system.

While the methods of maintaining building humidity levels within the desired range are not new, advances in system technology have made them more reliable, easier to control and less expensive to maintain.

**Humidification Systems**

Managers have five major types of building humidification systems to select from today: water spray systems; boiler-supplied-steam systems, packaged electric or steam systems; centrifugal atomizing systems; and pressurized- air systems.

Water spray systems are the lowest cost and simplest of the major building humidification systems. They operate by injecting a fine mist of water into the building's air supply, where it evaporates. Since the water is not heated, no energy is required to operate the system, resulting in low operating costs.

The systems, however, can have high maintenance costs, particularly if the mineral

content of the water is high enough to lead to clogging of the nozzles. The systems also must be frequently inspected to ensure that water does not pond in the duct downstream of the spray nozzles, a condition that can lead to fungi and bacteria growth.

Boiler-supplied steam systems are the simplest and least expensive type of system to install, provided the facility has a central steam plant and a steam distribution line is located close to the building's air supply. This system draws steam from the central boiler system and injects it into the air stream. Although these systems once were very common in facilities with large central steam plants, concerns over the impact of the boiler feedwater treatment chemicals on indoor air quality has led to their decline.

Packaged electric and steam systems use a small, dedicated boiler to generate steam that is free of contaminants. These systems, as with central boiler systems, inject steam directly into the air stream. Since the steam is generated in a dedicated system, there is no boiler- feed-water chemical-treatment system to contaminate the humidified air. Both packaged electric and steam systems offer the advantages of low first cost and low maintenance costs, although both require energy to generate the steam.

Centrifugal atomizing systems, unlike electric and steam systems, do not heat the water before injecting it into the air stream. Instead, water is sprayed onto a large rotating disk. Centrifugal force forces the water off the disk into an atomizing screen in the building's HVAC supply duct. There, it is broken into droplets that are 5- 1 0 microns in size. Air flows across the screen and dislodges the droplets, which evaporate into the supply air.

Centrifugal atomizing systems offer the advantages of low operating and maintenance costs and require no energy for steam generation. Depending on the mineral content of the water supply, however, it may be necessary to use treated water to prevent the clogging of the atomizing screen.

Pressurized-air systems operate by forcing high -pressure air through a nozzle. The pressure drop in the nozzle creates a vacuum that draws water into the nozzle, where it is broken into micron-sized particles and injected into the building's HVAC system air supply. Pressurized-air systems do not require energy to generate steam, but they do require the use of pressurized air. Their chief draw- back is the need for frequent cleaning of the nozzle, particularly when the mineral content of the water is high.

**Selecting a System**

Managers and specifiers must weigh a number of factors when evaluating building humidification options, including the climate in which the building is located, energy costs and

maintenance costs.

Geographic areas with long heating seasons probably will benefit more from a centralized approach to humidification than those with short heating systems. Managers of facilities in climates with limited heating requirements should consider installing small, localized units to serve specific areas of the facility.

Systems that inject steam into the air supply have much higher energy requirements than those that inject water at supply-water temperatures. If an inexpensive source of energy is readily available, such as natural gas, steam or waste heat, managers should consider using a steam- based system. If not, centrifugal atomizing or pressurized-air systems will be less expensive to operate.

Building humidification systems can be high-maintenance items, particularly if a facility's water quality is poor. Minerals dissolved or suspended in the water tend to clog discharge nozzles, foul atomization screens and coat boiler heat-transfer surfaces. All systems will re- quire some maintenance to minimize damage from mineral deposits.

**Technology Improvements**

All of the current types of systems for regulating the humidity levels in buildings have been in use for years. What makes today's systems so successful is recent developments in the technology used to control those systems.

One of the most significant improvements that has been made is in the way the systems sense humidity levels. In the past, humidity sensors have been made from a range of organic and inorganic materials. Most of these sensors were inaccurate and prone to failure, due to contaminants in the air supply. Today's generation of sensors is electronic, using thin capacitance film or bulk polymer resistance to measure changes in the moisture content of the building's supply air.

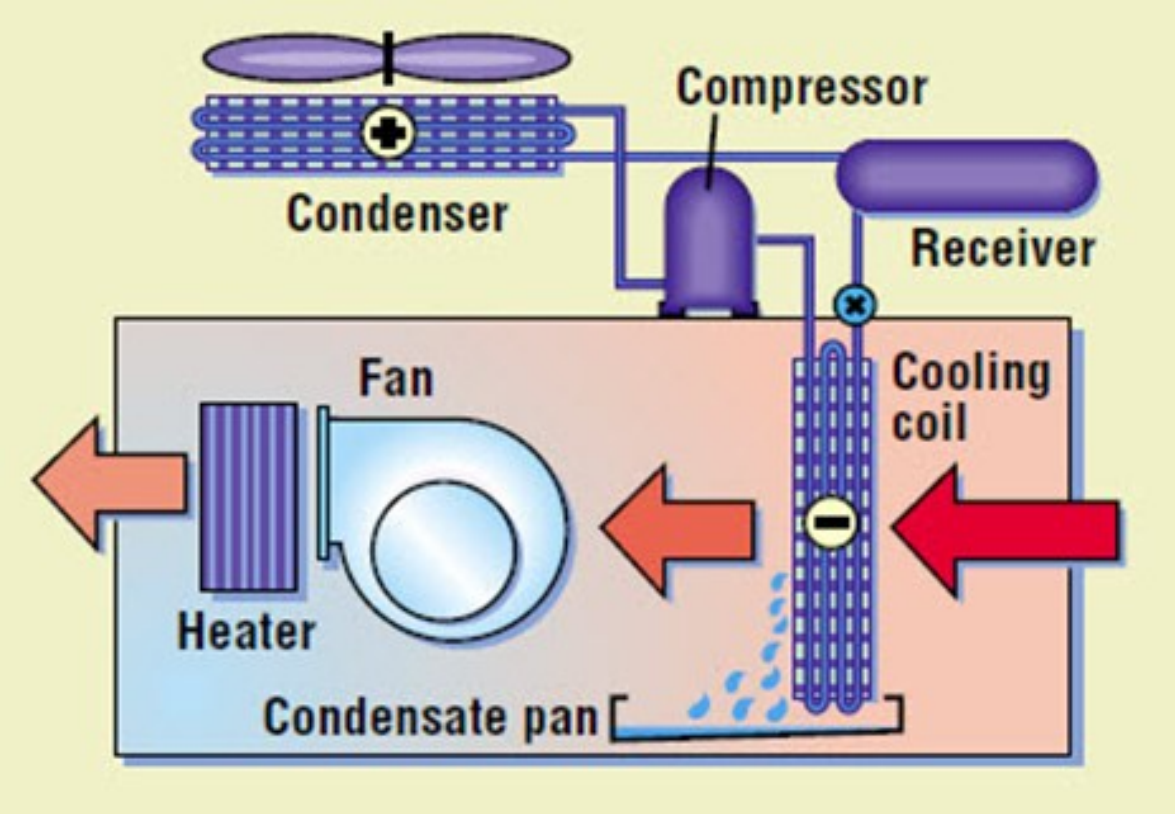
Both types are accurate to within 3 percent, operate over a range of humidity levels and provide fast response to changes in relative humidity. These sensors have given system designers the accuracy needed to provide the humidity control required in today's IAQ-conscious environment.

Changes in sensing technology have resulted in the way systems are controlled. Most system operations had used on-off controls, resulting in swings in building humidity levels as conditions changed. Today's systems - due, in part, to the rapid response of humidity sensors - are proportional. Sensors rapidly detect changes in building moisture levels and vary the output of humidification and dehumidification systems to keep a facility within the desired range.

Today's systems also use multiple sensing locations to provide a more accurate picture of humidity levels through- out the facility. The result of these developments in sensing and control technologies is that today's humidification and dehumidification systems finally give engineering and maintenance personnel the tools they need to meet the needs of building occupants in making the building environment as comfortable and healthy as possible.

**Dehumidification Technology**

Humidification systems are only half of the




story when it comes to regulating humidity levels in buildings. During air-conditioning months, humidity levels often are too high, which reduces occupant comfort, accelerates corrosion of electrical contacts in sensitive electronic equipment, causes condensation on cold surfaces, and creates conditions in the building that promote the growth of mold and bacteria.

Two major types of systems are used for dehumidification - mechanical refrigeration and desiccant-based systems. The majority of the installed dehumidification systems are based on mechanical refrigeration, but desiccant-based systems are growing in use due to their low energy requirements.

Mechanical-refrigeration-based systems operate by cooling a building's supply air below the dew point, causing moisture to condense out of the air. Since the air leaving the coils is at nearly 100 percent relative humidity, it must be mixed with warmer supply air or reheated before being introduced into the building space.

By increasing or decreasing the temperature of the dehumidifying coil, the system can vary the amount of moisture left in the air supplied to the space, thus regulating the humidity of the building space. The primary drawback of mechanical refrigeration-based dehumidification systems is their energy cost.

Desiccant-based dehumidification systems require much less energy than mechanical refrigeration systems. A wheel or drum coated or filled with a material that absorbs moisture, such as silica gel, slowly rotates in the duct of the building's air supply. As air passes across a portion of the wheel, the desiccant absorbs moisture, lowering the air supply's humidity level. As the wheel rotates, it passes through a second air stream, one that is heated. Moisture absorbed by the desiccant is released, thus regenerating the desiccant for another cycle. The primary drawbacks of desiccant- based systems are their size and the need for a second, heated air stream.

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# KenKen Puzzle

How to solve the Kenken puzzle:

*(Answers on page 33)*

- Fill in the numbers from 1 –6
- Do not repeat the number in any row or column
- The numbers in each heavily outlined set of squares, called cages, must combine (in any order) to produce the target number in the top corner using the mathematical operation indicated
- Cages with just one square should be filled in with the target number in the top corner
- A number can be repeated within a cage as long as it in the same or column

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2 | | | | 3 | 6 | | | |
| | 1 | | 8 | | | | 6 | 7 |
| 8 | 6 | | | 4 | | 5 | | 1 |
| | | | 6 | 9 | | | | |
| | 7 | 4 | 5 | | 8 | 2 | 9 | |
| | 3 | 5 | 2 | | | 6 | 1 | |
| | | 1 | 3 | | 2 | 8 | | 4 |
| 7 | 2 | | | | 9 | | | |
| | 4 | | | 8 | | 9 | 5 | |

# The Silent Gatekeepers: Why Recruiters Can Be Your Worst Enemies in the Hiring Process

Juan Carlos LaGuardia Merchán

In today's highly competitive job market, hiring practices have become as sophisticated as the technology that drives them. Facility managers, especially those experienced in leading complex, multidisciplinary teams, understand how critical it is to recruit the right talent.

Yet, surprisingly, one of the biggest barriers to securing top talent isn't the lack of candidates or the challenges of a demanding job market. **It's the recruiters themselves.**

Many professionals today feel that recruiters, rather than facilitating smooth hiring, can sometimes serve as formidable roadblocks to talent acquisition.

Let us examine why recruiters can prove an applicant's worst nightmare and how this affects the vital search for skilled team members in facility management.

**Understanding the Role... Or Not**

Recruiters often lack the deep, technical insight to truly understand the skills needed for specialised roles. For facility management positions, the technical requirements extend far beyond typical office skills. Facility managers need to assess energy systems, handle multi-vendor contracts, manage team dynamics across diverse projects, and make quick, data-driven decisions.

Many recruiters, however, approach these roles with only a superficial understanding, often mistaking experience with tools for actual technical expertise. The result? Qualified candidates are often passed over because they don't tick the recruiter's superficial checklist.

This barrier between the candidate's abilities and the recruiter's understanding is one of the leading causes of misalignment in the hiring process.

**Playing the Numbers Game**

It is becoming increasingly evident that recruiters, particularly those in large firms or agencies, are inclined to prioritise metrics over meaningful interactions. To meet the targets and deadlines that they have set, many recruiters rapidly assess the resumes that they have been given, focusing only on keywords or basic indicators of **"fit"**.

They may reject a candidate due to a lack of one specific certification, even though hands

-on experience would be more valuable in real-world applications. This reliance on automation and algorithmic sorting often leaves high-potential candidates who may have just a slight variation in their background out of the running.

Facility management, however, is about finding adaptable professionals who can learn and adjust quickly, not just those who check every box.

**Biases and Personal Preferences**

**Recruiters are humans**, and with that comes the inevitability of bias, sometimes unconscious. The **"halo effect"** or favouritism toward candidates from certain schools or backgrounds can overshadow a recruiter's judgement of individual capabilities.

Imagine a facility manager with hands-on experience in large-scale industrial operations, working alongside teams from diverse technical disciplines, competing against a fresh graduate with a prestigious degree but limited real-world experience.

While the former candidate undoubtedly possesses clear practical advantages, recruiters may still favour the latter due to an established preference for specific educational institutions or demographics.

This bias can be devastating to candidates and companies alike, as they lose out on people who bring genuine value through diverse skills and perspectives.

**The 'Cultural Fit' Conundrum**

"Cultural fit" is another filter recruiters frequently use to assess candidates, but it can be misleading, especially in facility management. Every facility team has its unique culture, shaped by the complex challenges they face daily.

Recruiters often try to enforce an abstract

idea of what "fit" should mean, without recognising the critical nuances of teamwork required in a facilities environment. A candidate who seems like a good fit on paper might lack the resilience, flexibility, and problem-solving skills necessary in real-world scenarios.

Conversely, highly adaptable candidates might be discarded due to trivial criteria, like the absence of one "preferred" trait, even if their experience suggests otherwise.

**Communication Gaps: Lost in Translation**

Recruiters act as the go-between for candidates and hiring managers, but this role can create a breakdown in communication. Candidates might feel discouraged or demotivated by vague or ambiguous feedback from recruiters.

Facility managers seeking specific skills may find that critical details about job expectations or challenges never reach the candidate. The lack of clear, direct communication can lead to missed opportunities on both sides, as candidates withdraw or misunderstand their prospects, while hiring managers are left wondering why the right fit was never found.

This disconnect ultimately undermines the primary goal of recruitment: finding a mutually beneficial match.

**Rethinking Recruitment for Better Results**

What can be done? For starters, recruiters should engage with facility managers and other technical leads more directly to truly understand the role's complexities.

Introducing technical assessments, structured conversations with relevant team members, and reducing dependence on automated filters can also vastly improve the process. Furthermore, removing personal biases and focusing on candidates' ability to solve real-world challenges would bring in a diverse and competent workforce.

Ultimately, recruiters can facilitate connections between professionals and impactful opportunities. However, when they revert to outdated methods, fail to recognise the subtleties of the role, or impose superfluous filters, they run the risk of becoming the very obstacle they were meant to overcome.

It is essential that Facility Managers and recruiters collaborate to develop hiring processes that attract individuals who can contribute value, adaptability, and genuine expertise to the organisation.

After all, true facility management success lies in finding individuals who can solve problems as effectively as they build solutions. And the right talent is only one thoughtful recruitment process away.

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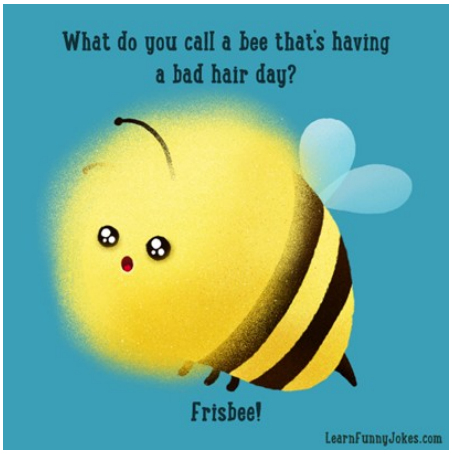
## Kenken Puzzle Answer

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2 | 5 | 7 | 1 | 3 | 6 | 4 | 8 | 9 |
| 4 | 1 | 9 | 8 | 2 | 5 | 3 | 6 | 7 |
| 8 | 6 | 3 | 9 | 4 | 7 | 5 | 2 | 1 |
| 1 | 8 | 2 | 6 | 9 | 3 | 7 | 4 | 5 |
| 6 | 7 | 4 | 5 | 1 | 8 | 2 | 9 | 3 |
| 9 | 3 | 5 | 2 | 7 | 4 | 6 | 1 | 8 |
| 5 | 9 | 1 | 3 | 6 | 2 | 8 | 7 | 4 |
| 7 | 2 | 8 | 4 | 5 | 9 | 1 | 3 | 6 |
| 3 | 4 | 6 | 7 | 8 | 1 | 9 | 5 | 2 |

**TEST YOUR OPERATOR IQ ANSWERS**

**Answers:** 1)b 2) d 3) c 4) e 5) c


## Just for laughs!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