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Building Operators Association of

Canada

Official Publication of the Building Operators Association (Calgary)

October 2025



MONTHLY
meetings

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Community Association

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What's Inside?

Executive & Committees	3
Important Phone Numbers	3
Presidents Message	4
Test Your Operator IQ	7
Water Heaters: Avoiding “Hot Water”	8
The Hidden Cost of Silence:	12
Sounds Good to Me	17
High Pressure Gas System Puzzle	21
Taming the High Cost Of Unplanned Maintenance in Multi-Site Facilities	22
Preventing Water Waste	28
Preventing Worker Injuries by Stressing the Benefits of Proper Tool Use	31
Kenken Puzzle	35
BOMA Course	37
Puzzle Answers	38
Advertising Rates & BOA Calgary Sponsors	39
Advertisers Directory	40

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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

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Front Cover:
Riley Halvorsen



President's Message

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



We are beginning the new year with some changes. The Danish Canadian Club has closed its doors, and we were left to find another place to hold our meetings. Our new meeting space is at:

[Thorncliffe Greenview Community Association 5600 Centre Street North](#)

The meeting dates and times will remain the same: second Tuesday of each month from 5 -7pm. There is plenty of parking available and the meeting rooms are spacious and bright. There is a restaurant at the centre, and the rooms are licenced to serve liquor.

Over the years we have had a memorandum of understanding (MOU) with BOMA Calgary. We have been approached by BOMA as to how we may bring us even closer together. We will be meeting with Lloyd Suchet the Executive Director as to how this will look. Personally, I am in favor of anything that will be of benefit to our Association. It is fitting that both BOA and BOMA are not for profit; I have thought of our relationship as BOMA being management and BOA being the boots on the ground.

With the new meeting place at Thorncliffe will allow us to resume our Biannual trade

show. There has been a five-year hiatus since our last one and it will be great to resume again in the new year. I will start looking for vendors to display the latest in technology for the Operators.

It has been a challenge this past year for the Association. The magazine has been successful, but we just need to get you out to attend the meetings. The guest speakers are awesome and the Q&A sessions after, is an opportunity to have your questions answered by an expert in their field. If you know of a subject matter expert that supports the Building Operators and would be willing to present at an association meeting, please Drop Mark Arton a line to chairman@boacalgary.com.

Invoices will be sent out shortly to members. Please process them as the funds are necessary to continue support meetings and to produce the magazine.

Warm regards,

Les Anderson

BOA Calgary President



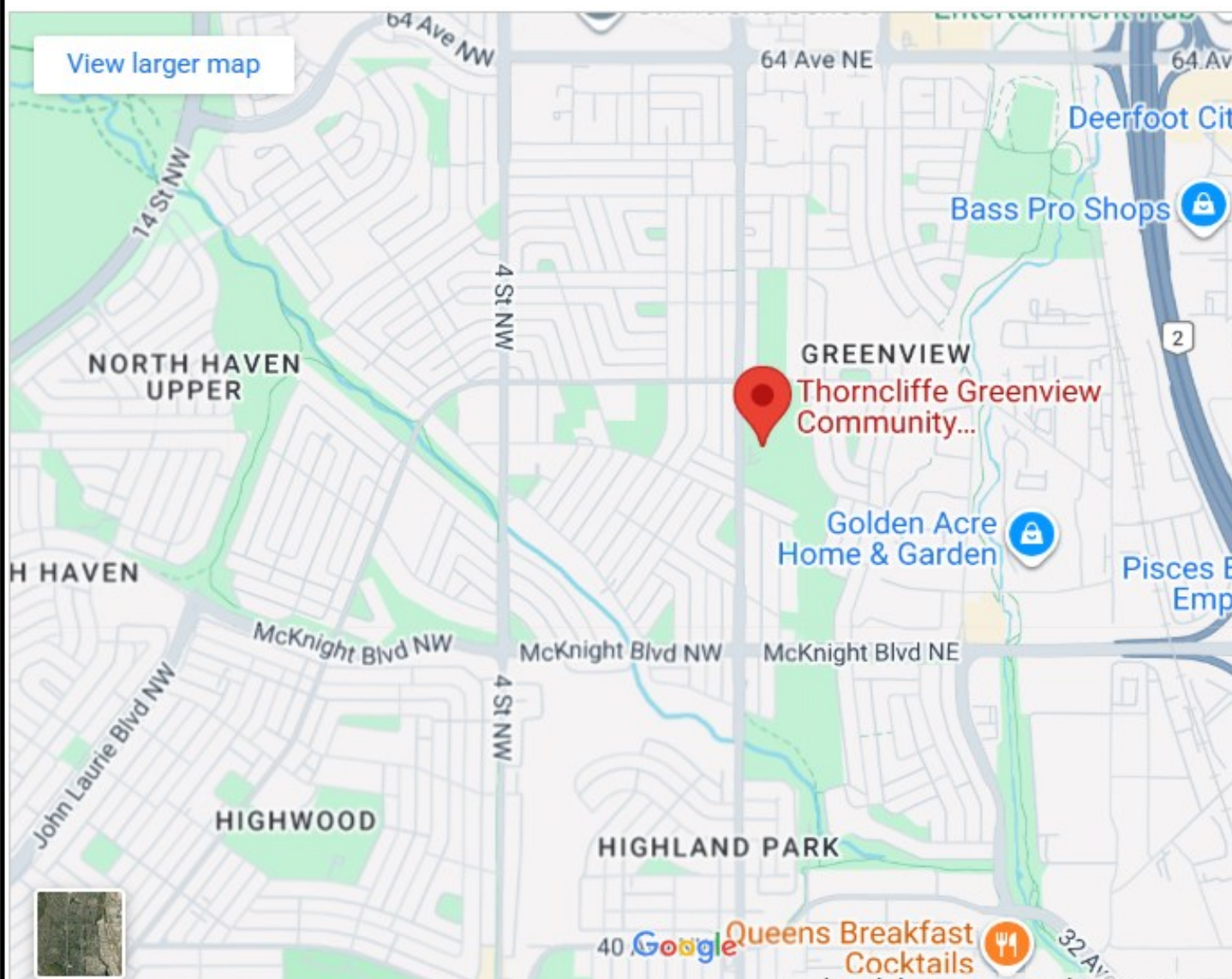
Join us at our Monthly Meeting on Tuesday

October 14th, 2025

at our new location:

Thornccliffe Greenview Community

5600 Centre St N, Calgary, AB T2K 0T3



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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 sound control and a sound investment.

Try our monthly Operator IQ challenge...answers on page 38

1. **Black smoke can be caused by:**
 - a. insufficient combustion air
 - b. too high a boiler pressure
 - c. too much nitrogen in the air
 - d. too much combustion air
 - e. high temperature combustion air

2. **Boiler stack temperature can rise if:**
 - a. excess air is reduced
 - b. the waterside of boiler becomes cleaner
 - c. the fireside of the boiler becomes fouled
 - d. flue gas CO value rises
 - e. fuel flow rate decreases

3. **Carbon monoxide is both explosive and:**
 - a. inert
 - b. expensive
 - c. non-compressible
 - d. gray in color
 - e. toxic

4. **Carbon which is not combined with hydrogen is referred to as:**
 - a. mono-carbon
 - b. loose carbon
 - c. separated carbon
 - d. united carbon
 - e. fixed carbon

5. **CO₂ is the chemical symbol for:**
 - a. carbon
 - b. carbon monoxide
 - c. carbon dioxide
 - d. hydrocarbon
 - e. carbonic acid

6. **Coal contains the following combustible components:**
 - a. nitrogen, oxygen, ash
 - b. hydrogen, oxygen, moisture
 - c. carbon, hydrogen, sulfur
 - d. CO₂, N, SO₂
 - e. carbon, ash, nitrogen



Water Heaters: Avoiding "Hot Water"



Properly specified, installed and maintained, systems can help facilities avoid problems related to occupant comfort and energy use

Domestic water heaters found in institutional and commercial facilities provide an often-overlooked opportunity to save energy. Depending on the facility and its demand for domestic hot water, these systems can account for 10-18 percent of total energy use.

With the use of new technology and proper maintenance of the installed systems, engineering and maintenance managers can reduce the energy requirements of these systems by up to 50

percent. And while much of the attention of new technology focuses on improved operating efficiency, these systems also can improve safety for operators and building occupants.

Condensing water heaters

Conventional gas-fired water heaters have a peak operating efficiency of 78-82 percent. They burn fuel in a combustion chamber, and the resulting combustion gasses pass through a heat exchanger, which transfers energy from the gasses to water. Much of the operating loss in these units comes in the form of heat carried out of the unit with the flue gases

Water — a natural byproduct of combustion



vapor — carries out part of the energy lost in the flue gases. Condensing water heaters recover much of this energy by using a larger heat exchanger or a second heat exchanger that reduces the flue-gas temperature to the point where this water vapor condenses, releasing even more energy.

Condensing water heaters offer a peak operating efficiency of 88-90 percent. Managers typically can recover their extra cost in one to two years' operation in most facilities and less in facilities with high hot-water demand.

Modulating systems

Conventional water heaters use on/off controls. As the system load varies, the boiler varies the amount of time it is on to meet the demand. Higher demand levels result in longer burn times, and lower demand levels

result in longer periods when the burner is off. Only when the boiler operates at peak load does the burner remain on for a long period of time.

While on/off controls are simple and inexpensive, they are not very efficient. Water heaters that cycle frequently increase losses through the boiler's flue gases. Depending on the frequency with which the water heater must cycle, these losses can reduce annual operating efficiency 10-50 percent.

Modulating water heaters offer an effective solution for reducing these losses. Instead of simply shutting off the burner when the system meets the demand for hot water, modulating boilers reduce the amount of fuel supplied to the boiler, cutting the rate at which hot water is generated without turning off the burner. Only when demand drastically falls off is the burner actually shut down. Modulating the burner instead of cycling reduces flue-gas losses and increases annual operating efficiencies by up to 50 percent.

New-generation water heaters that modulate the burner while condensing the flue gases can achieve operating efficiencies as high as 92-95 percent.

Modular units

In most commercial and institutional facilities, one water heater is sized to meet the facility's peak demand. In most facilities though, the demand for hot water varies widely with time of day and day of the week, often by a factor of 10 or more. For conventional water heaters, this means the unit will cycle frequently most of the time. Modulating water heaters reduce the cycling, which still will take place during periods of relatively low

demand.

An alternative to the single water heater is using multiple, modular units sized to meet a range of hot-water-demand levels. Each modular unit has a much lower capacity than the single, conventional unit. Under low-load conditions, one water heater can provide all of the required hot water. As the load increases, additional units automatically come online. Depending on the application and the demand for hot water, a facility might have up to 10 modular units.

Modular installation — using multiple, smaller water heaters — delivers increased annual operating efficiency over the use of a conventional single unit. The degree of improvement depends on the range of demand for hot water. Managers can expect that for most typical applications, a modular water heater approach can reduce annual energy requirements by at least 10 percent.

The use of modular water heaters also means facilities have backup hot-water units available. In a single-water-heater application, one unit failure results in a loss of hot water. But in a modular application, one heater's failure only reduces system capacity. Hot water is still available.

Point-of-use heaters

In traditional hot-water systems, a central

heater generates hot water, which then is distributed through a piping system to all points of use. Larger systems might require circulation pumps and storage tanks.

One major drawback of a central system is its overall operating efficiency. Typically, water must run for several seconds for hot water to reach each point of use, wasting both water and the energy used to heat it. Conduction losses from system piping and storage tanks further decrease operating efficiency. Circulation pumps require additional energy. As a result, it is not uncommon to find that the annual operating efficiency of central systems is 50 percent or less.

Point-of-use water heaters offer an alternative to the central hot water system. Instead of a single or multiple central water heaters, point-of-use systems feature multiple small water heaters throughout a facility at or near the point where the water is needed.

Heaters are sized to meet the demand of that use. They might be instantaneous water heaters or might include a small tank. By eliminating losses associated with central systems, point-of-use water heaters offer vastly improved annual operating efficiencies. Their primary drawback is the additional maintenance required needed to keep the larger number of system components operating and in good condition.

Heat-pump water heaters

The most efficient water heater is the electric resistance unit, which has an average efficiency greater than 97 percent. While this heater is the most efficient, it also is the most expensive to operate due to the high cost of electricity, compared to other water-heating fuel sources.



New heat-pump water-heater technology offers an electric alternative that has the advantages of very high efficiency and low operating cost. It produces about three times the quantity of hot water for the same amount of electricity.

Heat-pump water-heaters operate the same way that HVAC-system heat pumps do. They extract heat from the air and transfer it to the water. New-generation units are small and can readily serve as direct replacements for a range of water heater types and sizes.

Maintenance

No matter the type of water heater system installed, maintenance is essential for long-term performance, safety and high operating efficiency. Unfortunately, too many organizations simply ignore most systems until something goes wrong. Water heaters are like any other installed system; maintenance departments must maintain them through a program of regular inspection and testing.

Maintenance requirements vary with the size and type of equipment. Technicians should inspect all hot water outlets at least monthly for proper operation and leaks. No matter how efficiently the system provides hot water, waste through leaks and valves that won't fully close increases both energy and water costs.

Technicians also should test and adjust water supply temperature controls at least monthly, and they should inspect the entire system annually for leaks, as well as damage to components and insulation. They should flush all storage tanks annually to remove sediment, and they should inspect larger

tanks annually for scale. Finally, to promote safety for mechanics and building occupants, they should test all pressure-relief valves annually.

By following these routine maintenance tasks and by upgrading systems, managers can generate significant savings through reduced energy and water use.



Spotlight on Safety

New-generation water heaters can reduce the chances of a flashback fire where the water heater is installed. One safety problem related to the use of natural gas- and propane-fueled water heaters is the chance that the heater's flame will ignite flammable vapors in the room.

New flammable vapor ignition resistant (FVIR) designs can prevent this type of ignition by trapping and burning gas vapors within the heater, preventing the ignition of flammable vapors present in the space.

FVIR water heaters are marketed primarily to the residential market. But since the commercial and institutional market widely uses residential type water heaters, they can help improve safety in these applications, as well. This technology is particularly important when considering the type of materials found stored in spaces near water heaters.

The Hidden Cost of Silence: Why Neglecting Energy Preventive Maintenance is Draining Your Building and Your Budget

Juan Carlos LaGuardia Merchán



Walk into any corporate office, hospital, or data centre, and you'll see lights on, air handling systems humming, and screens flickering with metrics. Everything appears functional. But is it optimal? More often than not, the answer is a reluctant no.

Buildings are energy-hungry organisms. However, what we often forget is that energy is not just about kilowatts; it's about decisions. It's about how systems are maintained, how data is interpreted, and how proactively we act.

Having worked across critical environments, from biotech labs to financial hubs, I've come to a sobering realisation: our maintenance culture is reactive when it

should be strategic. And nowhere is that more evident than in the way we manage energy.

The Hidden Truth About Energy Maintenance

Energy inefficiencies rarely shout. They whisper, persistently, and expensively.

Consider a simple air-handling unit in a university laboratory. It's working, yes. But no one has recalibrated its sensors in three years. The filters are changed only when visibly dirty. The control logic hasn't been reviewed since commissioning. What does that mean?

- The unit might be cooling and heating at the same time.

- It may be operating at full capacity when only 40% is needed.
- It could be consuming 20–30% more energy than it should, every single day.

This is not an exception; it's the norm in many sites.



Why Preventive Energy Maintenance Falls Through the Cracks

Facility managers and building operators are not indifferent. We're overtasked. Firefighting, compliance, tenant demands, budget constraints, it's endless. Energy optimisation becomes a "nice-to-have," especially when systems appear to be running.

But there are deeper issues:

- **Lack of visibility:** Without real-time energy monitoring, inefficiencies remain invisible.
- **Fragmented contracts:** Vendors maintain their systems in silos, with no one looking at the holistic energy performance.
- **Misaligned KPIs:** Many teams are judged on uptime and tenant satisfaction, not energy efficiency.
- **Deferred maintenance culture:** If it's not broken, don't fix it. Except... energy waste doesn't look broken. It looks normal.
- And so, money bleeds out silently.

A Consultant's Lens: Stories from the Field

Let me share a real case.

A regional hospital in southern England was spending nearly £500,000 annually on electricity. I was brought in to advise on HVAC performance. Through thermal imaging, BMS log reviews, and physical inspections, we discovered:

- Several VAV boxes were stuck open, flooding spaces with cold air unnecessarily.
- Chillers were short-cycling due to a poorly tuned control loop.
- Nighttime setpoints had not been reduced in years.

Total investment in recalibrations, control updates, and staff training? £16,000.

Annual savings post-optimisation? £84,000.

Another example: A data centre that thought they were running lean. My team installed a temporary energy monitoring kit. It revealed that several server room CRAC units were fighting each other, one cooling, the other reheating. That site is now saving £113,000 per year after we reprogrammed the coordination logic.

This isn't about big spend. It's about big awareness.

From Passive to Proactive: How to Change the Game

Here's what I recommend to facility professionals who want to turn the tide:

1. Conduct a Tactical Energy Audit, Not a Cosmetic One

- Go beyond utility bills. Focus on system behaviours:
- Check operating schedules.
- Investigate simultaneous heating and cooling.
- Review control sequences with a critical eye.
- Include operators in walkthroughs, they often know where the ghosts are.



2. Map a Preventive Energy Maintenance Plan

Don't just list assets. Build routines based on energy impact:

- Motors and drives: Vibration, belt tension, and airflow alignment.
- Boilers: Flue gas analysis, burner tuning.
- AHUs: Damper calibration, control logic testing.
- Lighting systems: Occupancy sensor testing, daylight harvesting recalibration.

This is not just "maintenance," it's energy defence.

3. Train Technicians to Think in Kilowatts

Many good techs don't know the cost of a misbehaving pump or misaligned VFD. Include energy awareness in toolbox talks. Show them real numbers. Make energy savings part of your internal success metrics.

4. Use Temporary Metering Tools

Can't afford a permanent monitoring system?

Use portable loggers for two weeks. Compare input/output trends. You'd be shocked at what you'll find.

5. Create Accountability with Energy KPIs

Include energy use per square metre or occupant in monthly reports. Start with trend lines. No need for perfection, consistency reveals the story.

The Emotional Cost: More Than Just Money

We talk about costs in pounds and pence. But the emotional cost of poor maintenance is just as damaging:

- Tenants who complain about inconsistent temperatures grow disengaged.
- Engineers are frustrated by constantly reacting instead of solving.
- Directors are losing faith because they only see rising bills and vague explanations.

An energy-efficient building is not just "green"; it's a place of confidence. It radiates competence, calm, and control, and that feeling is infectious.

The Long Game: Operational Resilience

In times of economic tightening, preventive maintenance is often the first cut. However, that's precisely when it's most needed. Energy inflation, environmental scrutiny, and supply chain delays all render reactive strategies more dangerous.

Your building is your patient. Would you skip regular check-ups simply because there's no pain today?

When Budget Is the Barrier: How to Make a Difference Still

Here's what I've advised in resource-



constrained settings:

- **Prioritise the top 10 energy-consuming assets** and schedule preventive checks quarterly.
- **Bundle energy checks with regular maintenance**, no extra labour cost.
- **Negotiate performance-based contracts** with vendors (e.g., bonuses for reducing energy by 10%).
- **Leverage utility provider schemes**, many offer free or subsidised audits.
- **Engage the finance team differently:** Present projects as ROI, not cost.

Example: We replaced a faulty damper actuator (£380) and recovered the cost in 18 days through reduced overcooling. Finance loves that kind of language.

It's Not About Being Perfect, It's About Being Accountable

Preventive energy maintenance doesn't need a glamorous budget or a six-month strategy. It needs attention, intention, and ownership. It's the difference between being a building operator and being a building leader.

If you're a facility manager reading this, I encourage you not to wait for permission. Start small. Prove value. Document wins. Build trust. The rest will follow.

We're not just maintaining assets, we're stewards of operational integrity, financial discipline, and environmental responsibility.

If you're facing rising energy costs and feel your preventive strategy isn't delivering value, I'm here to help. As a consultant, I offer real-world solutions tailored to your building, your team, and your budget. Let's stop energy waste before it becomes your next crisis.

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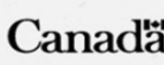
OVER 80,000 METRIC TONNES OF PUMPKINS ARE PRODUCED EVERY YEAR IN CANADA.

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 - Destruction Bay, Y.T.
 - Lac la Hache, B.C.
 - Jardins-Loup-Garou, Que.
- Do you know any others?

#SpookyPlaces #SpookySeason
 #CanadianCities #Canada
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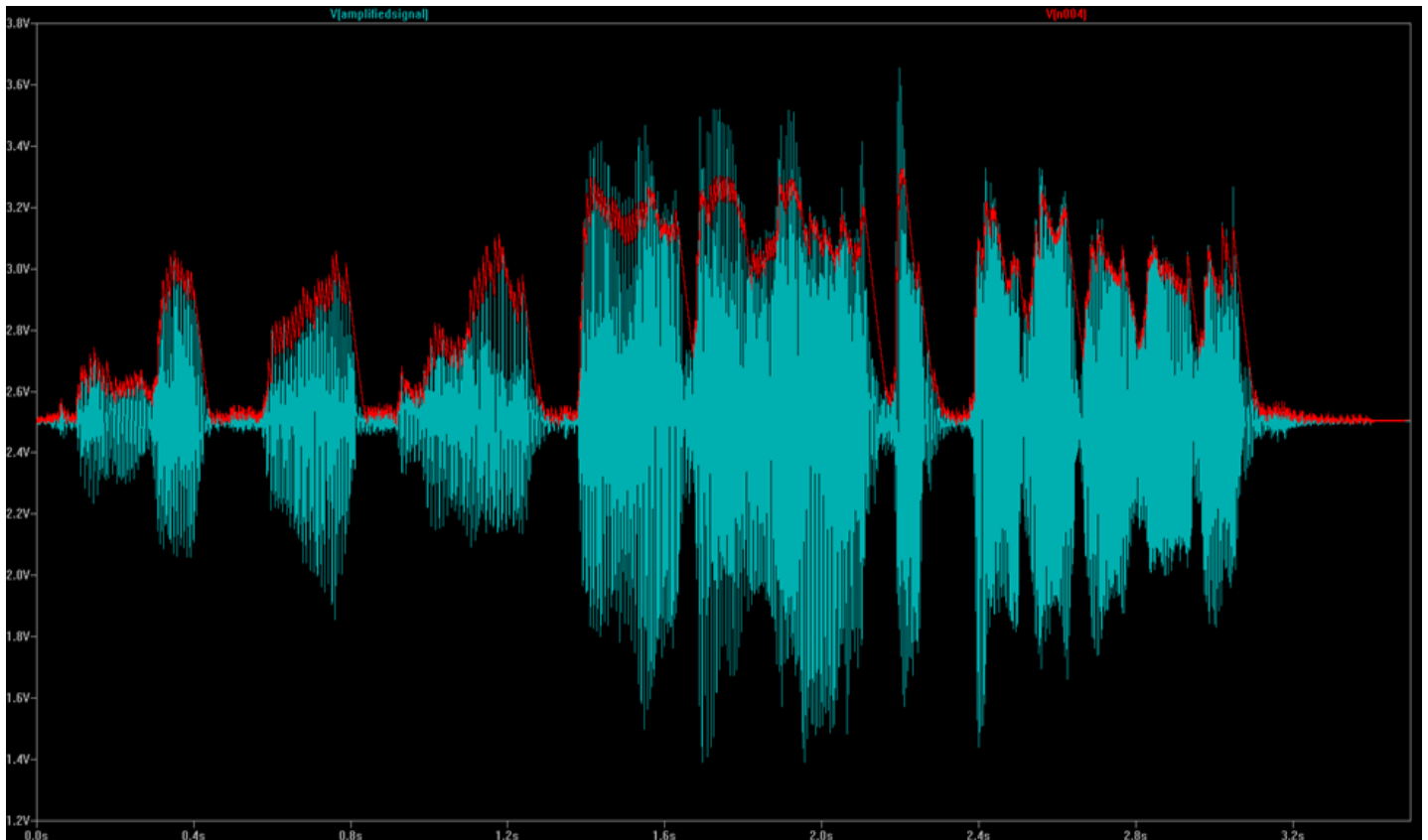
Sounds Good to Me

Tell them this: Hearing PPE is required in an area because there is no other feasible solution to protect them from an already identified, known hazard.

More than 30 million workers are exposed to hazardous noise levels in the workplace. It is estimated that costs just for work-related hearing disability exceed \$282 million annually! The National Institute for Occupational Safety and Health reports hearing loss is one of its priority areas for research for this century. Noise-induced hearing loss is the most common way for a person to lose hearing; one out of every 10 suffers a loss of hearing severe enough for it

to affect daily conversation and how normal speech is understood.

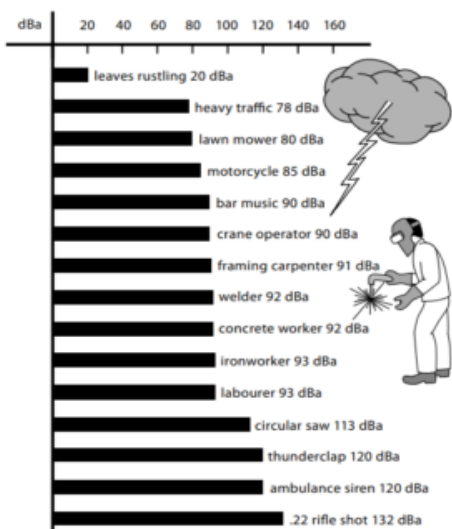
It is no wonder the Occupational Safety and Health Administration has implemented a hearing conservation standard for employers to follow. Noise exposure at work, though, is not our only exposure. More young people are starting their working careers with significant hearing loss already from noise exposures at home or in the environment. It's sad to think we are causing our children to go deaf through poor choices and high noise exposures even before they get to a legal working age.



What continues to amaze me, however, is that although noise-induced hearing loss is 100 percent preventable, it continues to be such a recurring problem. Why are employees continuing to suffer hearing loss that directly affects their safety, their work, and their quality of life?

Employees don't need to watch the same "plug-n-play" compliance video or listen to you read the hearing conservation standard to them every year. What a snooze!

In general, noise induced-hearing loss is not painful or obvious. Exposures to hazardous noise levels can cause temporary and gradual hearing loss that, with repeated exposure, becomes permanent. It is a silent killer (no pun intended--well, maybe) of nerve cells in the cochlea inside the ear that creates no pain, no visible signs of bleeding, and generally no immediately obvious signs of loss. Hearing does not come back once it is permanently damaged and gone.



What Can We Do?

In the workplace, start by conducting a hazard assessment related to noise. If you don't have

access to dosimeters, purchase a hand-held digital sound meter and carry it around with you. Measure some real-time decibel levels in the work environment and write

down what and where the levels are.

Once locations within the work environment are identified with noise levels above 85 dBA (the OSHA and MSHA action level requiring a hearing conservation program), you can begin to explore corrective action to reduce the harmful levels. Regulatory agencies want to see engineering controls used to reduce the noise level at the source whenever feasible. The next step involves administrative controls, such as rotating people mid-shift to cut exposure times. When engineering and administrative controls are not enough to eliminate the hazard, personal protective equipment is used as a last resort.



Training and Education

When training on the subject of hearing protection, I tell managers and employees the reason hearing protection is required in an area is because there is no other feasible solution to protect them from an already identified, known hazard. Hearing protection is required because there is no other means of protection. Failure to wear the protection guarantees hearing loss because all other feasible attempts to reduce the hazardous levels have been done.

This helps drive the point that there is exposure to a hazard that cannot be addressed by any other means. When they choose to not wear the protection, they are consciously exposing themselves to a known hazard and are taking risks that can reduce the quality of their lives permanently over time.



From there, I can begin sharing what some of the real-world decibel level readings were in and around the work environment. I use examples of decibel levels from outside of work, as well, to provide comparisons, such as gas lawn mowers, chain saws, weed eaters, leaf blowers, and other equipment that would be familiar to my employees.

Employees don't need to watch the same "plug-n-play" compliance video or listen to you read the hearing conservation standard to them every year. What a snooze! They do need to understand some basic hearing protection concepts and how hearing loss can occur. I had an employee tell me he didn't need to wear ear plugs any more because he was getting used to the noise. Unlike your body's ability to adapt to changes in heat and cold, you cannot

"toughen up" your ears. Your ears do not adapt to noise. You simply begin to go deaf.

Training and education in home-related exposures is as important as those at work. Employees need to know they should protect their hearing regardless of where they are.

My experience in working with managers and safety professionals shows that we often have missed some wonderful opportunities by taking the wrong approach in our training and accountability with our employees. For example, telling an employee to wear hearing protection while you are not wearing hearing protection is just being stupid. Some managers seem to think they have only to tell others what to do without the need to follow their own instructions. You have to play by the same rules you give your people. If that means wearing ear plugs when you walk through the shop, wear them. What your employees see you do is what they will do.

Next, once you are setting the example, hold your people to the same standard. Take a few minutes during each shift to observe people's performance. Make a conscious effort to see they are wearing the appropriate PPE for the tasks they perform. Have a handful of ear plugs in your pocket and, when necessary, personally hand an employee ear plugs and wait for him to insert them properly. This communicates to the employee your expectation, backed by the importance of the message.

Hearing protection comes in various designs, sizes, and formats. There is no "one

size fits all" for every work environment. Talk with your managers and employees and make every effort to get the right protector for the right task matched to the right person. For example, I wore ear plugs for years but developed a problem with wax build-up from "cramming" plugs into my ears and wearing them for 12-hour shifts. Once the doctor cleaned them out, I began using ear muffs and have not had a repeat problem. Some employees develop rashes or react to certain plug types. Others may develop discomfort and rashes from wearing muffs in a hot and humid environment. Size does matter for ear plugs to match ear canals, for both protection and comfort.

Administrative Requirements

Audiograms (hearing tests) are required when employees are exposed to decibel levels above 85 dBA. A baseline hearing test that is conducted by a licensed or certified audiologist is required and should be provided soon after an employee is hired or once he/she is assigned to a work area where exposure to noise is a problem. This lets the employee and you know whether there is already hearing loss prior to work exposures at your facility. It also gives you an opportunity to help the employee conserve and protect what hearing he or she has.

After the baseline test, annual tests are required. When the annual test comes due, explain to your employees the benefit of taking the test, as it measures current hearing levels compared to original hearing levels. Share with them that change in hearing does not necessarily mean it is work-related. If you have a good conservation program at work with employee participation, you shouldn't

see an adverse change that would reflect a working condition. This is why training and education in home-related exposures is as important as those at work: Employees need to know that protecting their hearing regardless of where they are is important to keeping their hearing and their quality of life as they get older.

Of course, no program is complete without recordkeeping requirements. Training records, audiogram results, hazard assessment results--all of these must be retained and properly documented, not just to comply, but also to help you improve and measure your hearing protection program.

Additional Resources

If you need help with your hearing conservation program or training, there are plenty of solid resources you can tap. Check with your worker's compensation insurance carrier or your liability carrier for information. Invite your local audiologist to provide material or conduct a training session for you. Contact your PPE supplier or a manufacturer's representative for videos, newsletter materials, or guest appearance at one of your training programs.

Your occupational physicians can be utilized for material and asked to help you conduct a



health fair that includes hearing protection. Other sources may include trade associations, Web searches for pertinent articles and illustrations, and your local library. For additional compliance and training assistance, search the OSHA and MSHA Web sites, as well as that of NIOSH.

You don't have to reinvent the wheel when it comes to hearing protection materials and programs. You do have to keep your managers and employees engaged in the process. Your goal is not simply compliance



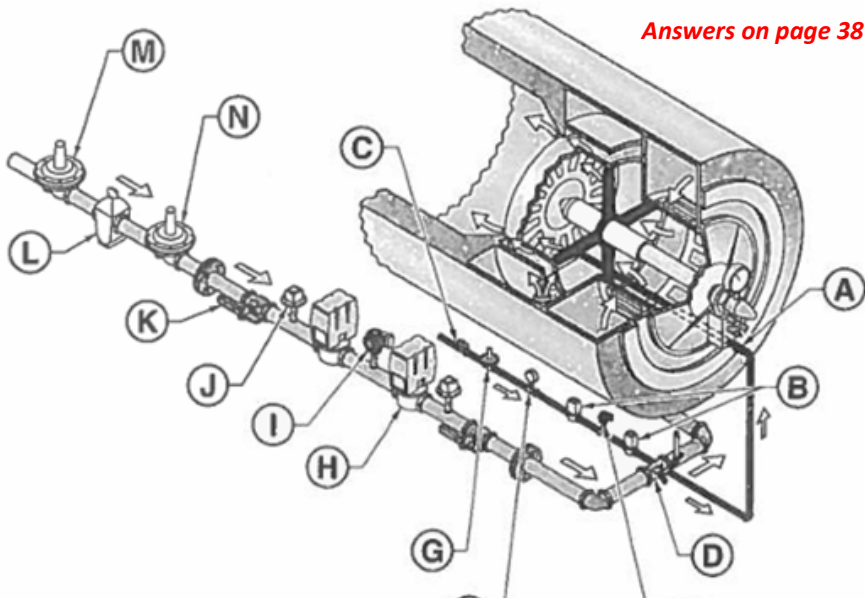
but hearing protection that will ensure on- and off-the-job protection.

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High Pressure Gas System

Answers on page 38



- | | |
|--|---|
| _____ 1. Utility meter | _____ 8. Pilot pressure regulator |
| _____ 2. Pilot vent valve | _____ 9. Pilot valves |
| _____ 3. Main gas vent valve | _____ 10. Pilot pressure gauge |
| _____ 4. Pilot adjusting cock | _____ 11. Main gas shutoff cock |
| _____ 5. Utility pressure regulating valve | _____ 12. Pilot shutoff cock |
| _____ 6. Low gas pressure switch | _____ 13. Main gas valve |
| _____ 7. Butterfly gas valve | _____ 14. Plant pressure regulating valve |

Taming the High Cost of Unplanned Maintenance in Multi-Site Facilities

[Juan Carlos LaGuardia Merchán](#)



As a Senior Facility Manager, I have witnessed firsthand the financial and operational havoc wreaked by unplanned maintenance. From sudden HVAC failures in the depths of a Prairie winter to unexpected plumbing issues across a portfolio of retail sites, these disruptions are more than mere inconveniences, they are costly, disruptive, and often preventable.

The Hidden Costs of Unplanned Maintenance

Unplanned maintenance refers to unscheduled repairs or interventions necessitated by equipment failures, structural issues, or other unexpected facility problems. Unlike planned maintenance, which is budgeted and scheduled, these incidents catch facility managers off guard, leading to a cascade of financial and operational challenges.

The costs are multifaceted. Direct expenses include labor, parts, and, often, premium rates for emergency call-outs. For multi-site operations, these costs multiply across locations, particularly when specialized technicians must travel to remote sites. In Canada, where facilities may span provinces with varying climates, from the frigid temperatures of Alberta to the humid summers of Ontario, equipment such as boilers, chillers, or roofing systems is particularly prone to unexpected failures.

Indirect costs are equally significant. Downtime disrupts business operations, whether it's a retail store unable to open or an office building with compromised air quality. Tenant dissatisfaction, lost revenue, and reputational damage can quickly escalate. In my experience managing a

Maintenance



portfolio of commercial properties, a single HVAC failure in a high-traffic shopping Centre could lead to tenant complaints and reduced footfall, with ripple effects on lease renewals.

Moreover, unplanned maintenance often requires reallocating resources, diverting funds from capital projects or delaying scheduled upkeep. This creates a vicious cycle: neglected preventive maintenance increases the likelihood of future failures. Industry data underscores this issue. According to a 2023 report by the International Facility Management Association (IFMA), unplanned maintenance can cost up to three times more than planned maintenance, with downtime and emergency repairs driving the bulk of expenses.

Why Multi-Site Facilities Are Particularly Vulnerable?

Managing multiple sites amplifies the challenges of unplanned maintenance. Each location has unique systems, occupancy patterns, and environmental factors, making standardization difficult. In Canada, regulatory requirements, such as

compliance with provincial fire codes or accessibility standards like Ontario's Accessibility for Ontarians with Disabilities Act (AODA), add further complexity. A failure in one site can strain resources across the portfolio, as teams scramble to address the issue while maintaining operations elsewhere.

During my tenure overseeing a network of industrial and retail facilities, I encountered a particularly illustrative case. A sudden electrical fault in a warehouse in British Columbia triggered a chain reaction: emergency repairs drained the maintenance budget, forcing us to delay roof inspections at other sites. The following winter, undetected leaks at a second location led to costly water damage. This experience highlighted a critical truth: in multi-site management, a single failure can have portfolio-wide repercussions.

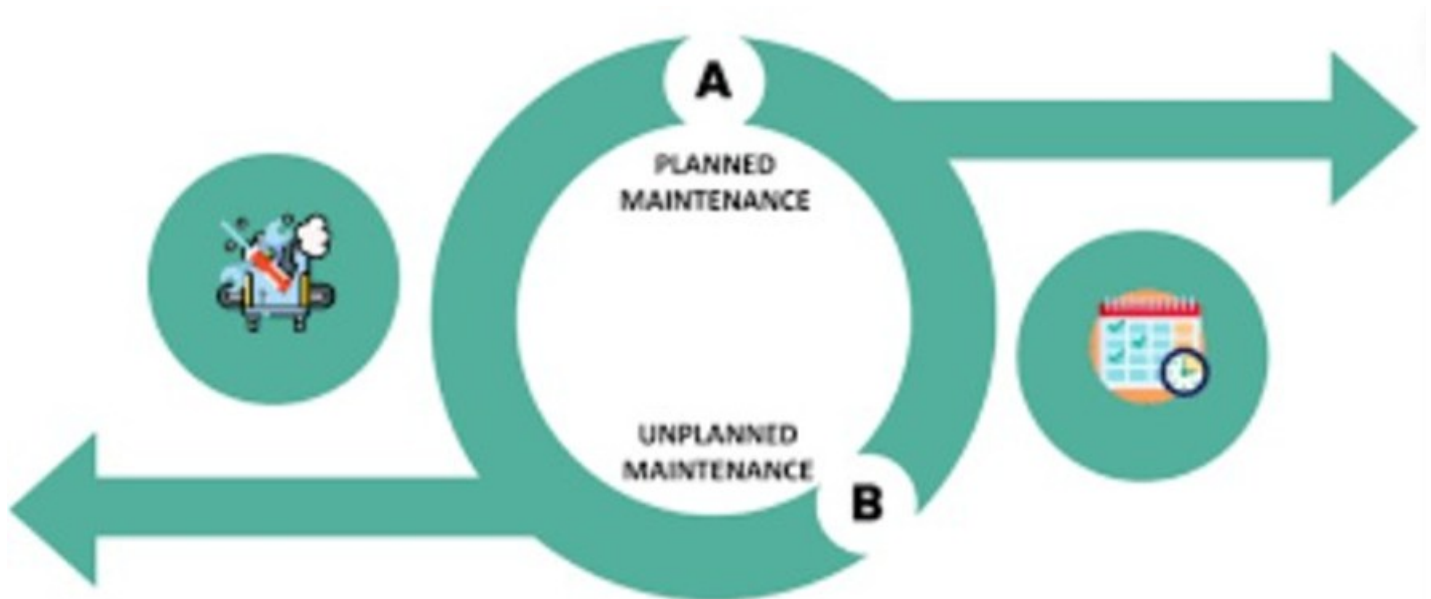
Geographic dispersion also complicates response times. In Canada's vast landscape, dispatching technicians to remote sites, say, a manufacturing plant in rural Manitoba, incurs significant travel costs and delays. Meanwhile, urban sites face their challenges, such as coordinating repairs amidst high tenant expectations and dense occupancy.

Root Causes of Unplanned Maintenance

To address the high cost of unplanned maintenance, we must first understand its root causes. Based on my experience and industry insights, several factors contribute:

- 1) **Ageing Infrastructure:** Many Canadian facilities, particularly in older urban centres like Toronto or Montreal, rely on outdated systems. Boilers, electrical panels, or plumbing installed decades ago are more prone to failure, especially under modern usage demands.

- 2) **Inadequate Preventive Maintenance:** Budget constraints or competing priorities often lead to skipped or deferred maintenance, increasing the risk of breakdowns. This is particularly common in multi-site portfolios, where resources are spread thin.
- 3) **Lack of Data-Driven Insights:** Without real-time data on equipment performance, managers rely on reactive approaches, addressing issues only after they arise.
- 4) **Environmental Stressors:** Canada's extreme weather, sub-zero winters, heavy snowfall, and coastal humidity accelerate wear on HVAC systems, roofing, and exteriors, leading to unexpected failures.
- 5) **Human Error or Oversight:** In multi-site operations, inconsistent training or communication gaps among maintenance teams can result in missed inspections or improper repairs.
- Strategies to Mitigate Unplanned Maintenance**
- Drawing on my experience and industry best practices, I've outlined five actionable strategies to reduce the frequency and cost of unplanned maintenance in multi-site facilities. These approaches balance cost, technology, and operational efficiency, tailored to the Canadian context.
- 1. Adopt Predictive Maintenance Technologies**
- Predictive maintenance leverages technology to anticipate failures before they occur. Internet of Things (IoT) sensors, integrated with facility management software, monitor equipment performance in real time, detecting anomalies such as unusual vibrations in a chiller or temperature spikes in an electrical panel. By analyzing this data, managers can schedule repairs proactively, avoiding costly emergencies.
- In one multi-site retail portfolio I managed, we implemented IoT sensors across HVAC units at



Unplanned maintenance and how to prevent it



12 locations. The system flagged a compressor issue in a Calgary site, allowing us to replace a single component rather than the entire unit, a repair that saved over CAD 15,000. While the upfront cost of such technologies can be significant, the return on investment is substantial, with studies suggesting predictive maintenance can reduce downtime by up to 50%.

2. Implement a Robust Preventive Maintenance Programmed

A well-structured preventive maintenance programmed is the backbone of cost control. This involves regular inspections, servicing, and minor repairs to keep systems in optimal condition. For multi-site facilities, standardizing maintenance schedules across locations ensures consistency, while site-specific adjustments account for local conditions, such as harsher winters in Edmonton versus milder ones in Vancouver.

Key steps include:

- Conducting annual audits to assess the condition of critical systems (e.g., HVAC, plumbing, electrical).
 - Creating a centralized database to track maintenance histories and schedules.
- Allocating budgets to prioritize high-risk assets, such as ageing boilers or heavily used elevators.

In my experience, investing 10-15% of the maintenance budget in preventive measures can reduce unplanned repairs by nearly a third, freeing up resources for strategic upgrades.

3. Leverage Integrated Workplace Management Systems (IWMS)

Managing multiple sites requires a centralized platform to coordinate maintenance, track costs, and priorities tasks. An IWMS consolidates data on assets, work orders, and budgets, providing a holistic view of the portfolio. For example, platforms like Plano or ServiceNow enable managers to monitor

equipment performance across sites, allocate resources efficiently, and generate reports for stakeholders.

In a previous role, adopting an IWMS reduced our response time to maintenance issues by 25%, as we could dispatch technicians based on real-time data rather than manual reports. For Canadian facility managers, selecting an IWMS with compliance tracking features is critical to meet provincial regulations, such as workplace safety standards under the Canada Labor Code.

4. Invest in Staff Training and Communication

Human error is a significant contributor to unplanned maintenance. In multi-site operations, where teams may be spread across provinces, ensuring consistent training and communication is essential. Regular workshops on equipment handling, safety protocols, and emerging technologies empower staff to identify potential issues early.

I recall a case where a junior technician in a Nova Scotia site overlooked a minor leak during an inspection, leading to a CAD 20,000 repair. Post-incident, we introduced quarterly training sessions and a digital checklist system, which reduced similar oversights by 40%. For multi-site managers, fostering a culture of accountability and collaboration is as important as investing in technology.

5. Plan for Environmental Resilience

Canada's climate poses unique challenges, from heavy snow loads on roofs to

corrosion in coastal facilities. Incorporating environmental resilience into maintenance planning can prevent costly failures. This includes:

- Specifying weather-resistant materials during retrofits, such as corrosion-resistant piping in Atlantic Canada.
- Scheduling pre-winter inspections to ensure HVAC systems and insulation are winter-ready. Partnering with local vendors for faster response times in remote or weather-affected areas.



In one instance, reinforcing the roofing systems across a portfolio of Ontario warehouses before a harsh winter prevented collapses that could have cost millions. Proactive planning, informed by local climate data, is a cost-effective way to mitigate risks.

The Financial and Operational Benefits

Implementing these strategies yields tangible benefits. Financially, reducing unplanned maintenance lowers emergency repair costs, extends asset lifespans, and optimizes budget allocation. Operationally, it minimizes downtime, enhances tenant satisfaction, and strengthens compliance with Canadian regulations. For multi-site facilities, where scale amplifies both risks and rewards, these benefits are even more pronounced.

In my career, transitioning a portfolio from a reactive to a proactive maintenance model

reduced annual maintenance costs by 20% and improved tenant retention by 15%. These outcomes demonstrate that addressing unplanned maintenance is not just a cost-saving measure, it's a strategic advantage.

Overcoming Implementation Challenges

Adopting these strategies is not without hurdles. Budget constraints, resistance to technology, and the complexity of multi-



site coordination can pose barriers. To overcome these:

- **Secure Stakeholder Buy-In:** Present data on cost savings and ROI to justify investments in technology or training.
- **Start Small:** Pilot predictive maintenance or IWMS in a single site to demonstrate value before scaling.

Engage Teams: Involve staff in the transition process to build trust and ensure adoption.

In my experience, gradual implementation coupled with clear communication, eases the transition and maximizes impact.

The high cost of unplanned maintenance is a challenge no facility manager can ignore, particularly in multi-site operations. As

industry professionals, we have the tools, expertise, and responsibility to shift from reactive to proactive strategies. Whether you oversee a single facility or a nationwide portfolio, take the first step today: audit your maintenance practices, explore predictive technologies, or invest in staff training. The financial and operational rewards are well worth the effort.

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SCARY STATS

OVER 80,000 METRIC TONNES OF PUMPKINS ARE PRODUCED EVERY YEAR IN CANADA.

HOWEVER, STATISTICS CANADA ESTIMATES THAT OF THIS, 50,000 METRIC TONNES OF EDIBLE PUMPKINS END UP IN THE TRASH.

Preventing Water Waste



Identifying and repairing sources of water waste in facility systems helps prevent small problems from becoming costly headaches

Maintenance and engineering managers are all too familiar with the fact that the more building construction done, the greater the maintenance workload becomes, and the more difficult it is to keep all systems performing efficiently.

Plumbing system efficiency is increasingly important to institutional and commercial facilities searching for savings in all areas of operations. Unfortunately, in many facilities, leaks and water waste in general tend to undercut this need for efficiency. A strategic approach to identifying and remedying water waste can curtail small problems before they become costly headaches.

Water-waste culprits

The most common plumbing trouble spots tend to be the water and steam lines that are under varying pressure. Less commonly, trouble can occur in the drain and sewer lines, which are not under pressure but get clogged, causing overflows.

Hot- and cold-water piping systems are usually copper, while steam and gas piping are malleable iron. Piping itself is usually not a problem unless it is very old, in which case leakage might occur first at the threaded joints or flanges, then in pipe walls, where pinholes appear due to thinning of the wall from corrosion and erosion.

Other frequent problems, however, occur in water valves, steam valves, pipe elbows, tees, unions and the like. Since the valves contain moving parts such as rubber O-rings, packing, valve stems and seats, they are vulnerable to

normal wear, corrosion, erosion and mineral buildup.

In steam lines, erosion from high-velocity steam and corrosion from acid concentration cause thinning of the walls. Water hammer can crack piping or loosen joints and cause leaks in the header piping and thinner-walled heating coils.



Air-conditioning system piping might develop leaks, or the internal surfaces might be fouled by refrigerant oil, which can carry other contaminants through the system and shorten the life of pumps, refrigeration units, cooling towers and piping.

Maintenance strategies

Frequent inspection of the following systems will reveal many waste reduction savings opportunities.

Hot- and cold-water systems. The sound of hot or cold water running, the sight of faucets dripping when turned off, or wet spots on the floor or ceiling where leaks are occurring are obvious first signs of plumbing trouble. But sometimes, the only indication is discoloration at the source of the leak — a rust stain on steel pipe or a blue-green copper oxide corrosion stain on copper pipe. Fixtures might show a mineral buildup near

the faucet or flush stem before any accumulation of water appears. This buildup might be a sign of a very slow leak.

To reduce efficiency loss, managers can lower water-heater temperature settings and drain heaters of rust and residue. In high-use areas such as dormitories and patient rooms, installing automatic water shutoffs reduces water use substantially.

In older systems, sometimes no leakage appears at all, but the faucet becomes harder to open and close. If no action is taken, the valve soon will freeze solid, and no amount of force will open or close it. This is especially true where a valve is used very seldom, as in shut-off valves under sinks and other fixtures. Because no water flows around the seat or moving parts, minerals build up on them, creating a permanent seal.

Steam. Steam leaks usually are visible and look like water vapor. Leaks usually appear first at valve stems, piping joints or heating coil tubes. Then, as the effect of wear continues, leaks become more widespread and begin showing up on the pipe walls, as well. Steam traps located in heating-coil enclosures or boiler room that are not connected to a return system can be a major loss source.

Besides including fixture checks, PM inspection routes should include checks of valves that are used infrequently, such as supply shut-off valves and pop valves on boilers. These valves might not be cycled for years under normal operating conditions. When they become frozen by mineral buildup and corrosion, boiler pressure relief valves (PRV) can cause an explosion.

In the case of a water supply valve, it would be more of a nuisance situation. It is good practice to clean and cycle these seldom-used fixtures at least annually, so they continue to function when needed.

In the case of boiler PRVs, cleaning and inspection is done during the summer boiler shutdown. Returning condensate to the boiler saves on both feedwater makeup and softener chemicals. Building management systems and controls, including programmable thermostats, should be inspected and adjusted at least quarterly to ensure they are at optimum settings.

Air-conditioning system components, such as chillers, pumps, cooling towers, and associated piping, are subject to heavy wear and tear and suffer loss of efficiency when water piping gets fouled by oil leaking through worn or damaged seals. In addition to a good cleaning every year and periodic inspection and repair, a refrigerant enhancer can prolong the life of these units and increase efficiency. Refrigerant oil can carry pipe welding slag, compressor winding varnish and other impurities into parts of the system, reducing heat transfer and causing flow friction, which reduces capacity.

As a result, the American Society of Heating Refrigeration and Air Conditioning Engineers estimates most systems lose 2-5 percent efficiency each year. Government reports show significant results from using enhancers, including reduced operating costs, more capacity, less run time, less friction, and longer, quieter operation.

Payback from maintenance

A comprehensive daily plumbing inspection program, corrective maintenance, and some updating and retrofits to take advantage of innovations, can bring substantial and quick return on investments. As problems are solved, or improved preventive maintenance inspections and upgrades eliminate frequently occurring problems, managers can redirect funds to more productive uses.



They also will be able to convert much of the firefighting time to routine, scheduled repairs that don't interrupt students, patients or employees. By calculating the amount of plumbing work to be done in labor hours per year, managers can ensure adequate staffing or show tasks that won't be done with inadequate staffing.

Here is a rule of thumb: Every 2,000 hours of work available — 50 weeks multiplied by 40 hours — equals one skilled, full-time pipefitter or plumber.

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Preventing worker injuries by stressing the benefits of proper tool use

Probably the most effective - and most overlooked - accident prevention measure in maintenance is tool safety. Managers can greatly reduce worker injuries by focusing their efforts on manual hand tools, such as screwdrivers and chisels, and on heavy-duty power tools, such as air-powered hammers, saws and drills.

For these efforts to succeed, managers must understand and use tool safety techniques designed to prevent injuries. Managers can reinforce these safety techniques through training sessions and other efforts designed to create a culture of safety.

Signs of danger

Tradespeople face a variety of dangers that arise from unsafe tool use, so the first and most important step toward safety is getting them to recognize the conditions that can cause injuries.

Take saws, for example. Wood that is wet, pitchy and full of knots can cause a saw to kickback suddenly, injuring the worker. Kickbacks in this context are defined as the sudden backward movement of the saw that causes loss of control, often resulting in severe injuries to arms, hands and legs.

Tradespeople using saws should use good-quality wood, not wood that is warped, wet or full of pitch or knots. They should use



sharp blades, making sure to examine the blade for excess sawdust in the grooves and brushing or blowing out any that has collected.

Dull blades or those with rust spots can cause kickbacks. Dull blades result in workers having to apply more force. The added force causes excess friction on the blade, allowing it to heat up and potentially warp.

Safety training should emphasize that workers should not force any tool to its limit. Proper technique calls for a worker to push



the saw with light force and allow it to complete its job.

Workers also must wear eye and hand protection to prevent wood chips from harming eyes and slivers from entering the hand. Managers also should be sure that tool guards are installed and in use during tool operation.

Shocking problems

Another common hazard with saws is electrocution. Train workers to carefully inspect the tool’s cord, as well as the entrance point where the cord meets the appliance. Replace any cords that are frayed or in poor condition. Cords also should be replaced, not simply taped, if there are spots where the cord’s insulation Workers also should not operate saws in damp or moist areas. High humidity levels can cause short-circuits, especially if a tool is in poor condition. Excess vapor in the air can come in contact with motor parts that have a sparking action. Sparks are caused by the motor’s

brushes coming in contact with the commutator.

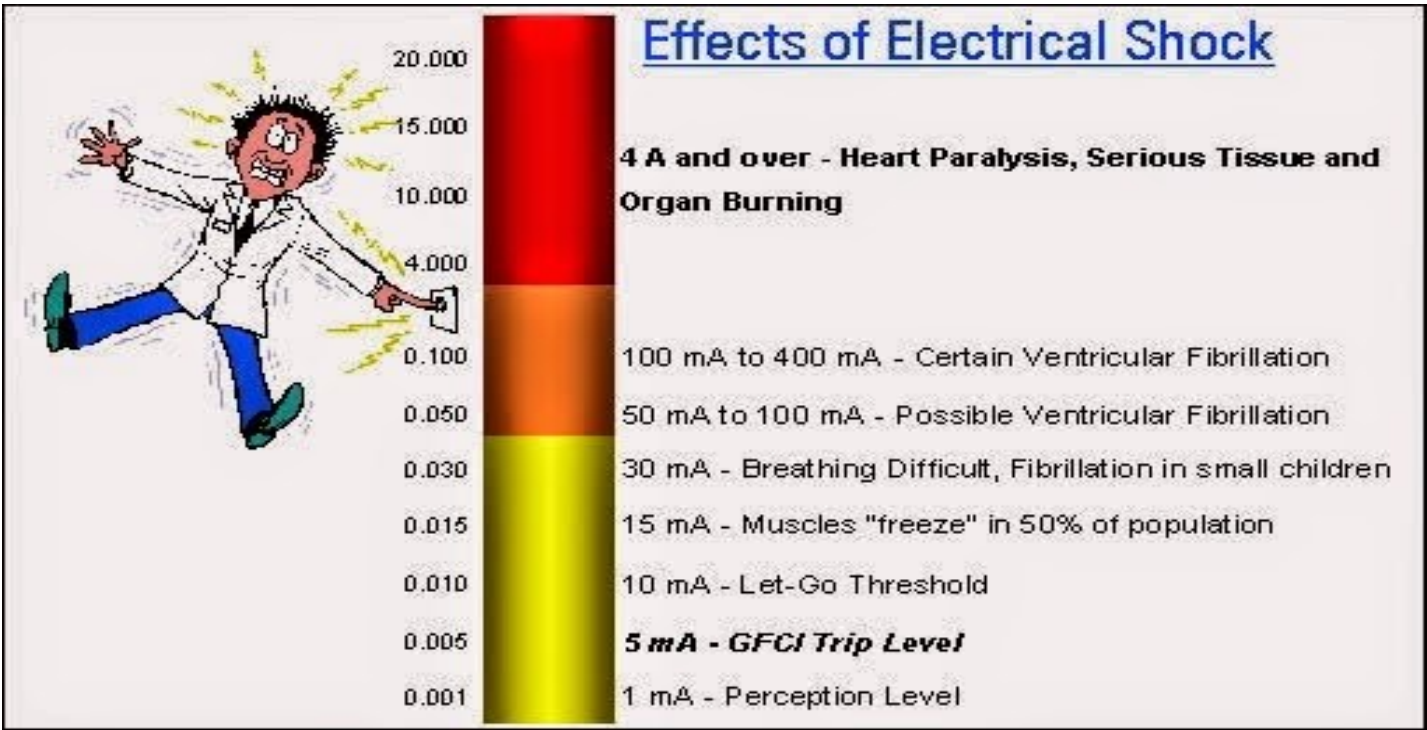
If a crew must work in a damp area, they should have proper ventilation, such as a fan running, or they should use a saw with an enclosed motor.

Drilling for safety

Drills also present a range of safety concerns.

Workers using a drill must use a bit that is the correct size for the job. Using a bit that is too small may allow the bit to loosen and separate from the chuck. Using a bit that is too large can result in jamming.

The tool user should make sure the chuck is tightened down before starting the drill, be sure to use bits that are sharp and free of dust, and blow out or brush out dust from the bit if it becomes clogged from excess work. Also, grabbing a bit or chuck when turning the power on can result in burns, abrasions and other





serious injuries.

Using excess force when drilling also creates problems. Users may need to be reminded to be patient with the drill and let it move forward with light pressure. Excess force results in friction, which can damage the bit, shorten the life of the motor and cause jamming.

When a bit is jammed, shut off the power, loosen the chuck so the bit separates from

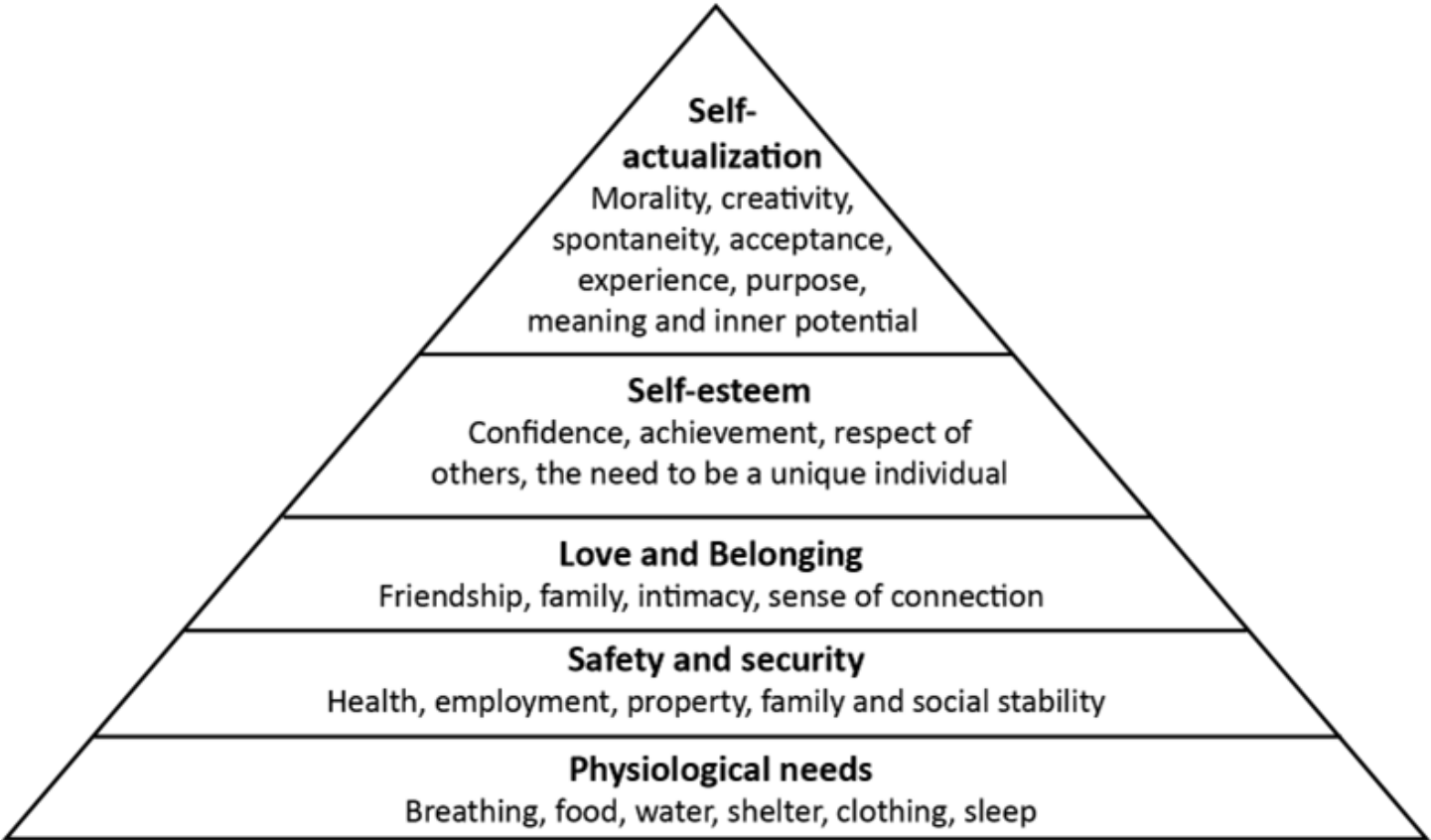
the chuck and use a pliers to remove the bit from the work piece.

When using a drill to remove rivets or when drilling through metal, workers should always use protective eye wear. Burrs and metal filings can fly around, causing eye injuries. Auxiliary handles on drills are designed to provide extra stability. Workers should be reminded to firmly grasp the handles and brace the drill. As with other electrical tools, cord inspection and replacement, if needed, are essential for safety.

If using a drill equipped with a screw bit set, workers must use the correct bit for the head of the screw. Not doing so can result in the screw head becoming damaged or the user losing control.

No screwing around.

Screwdrivers are probably the most used — and abused — of maintenance tools. Never



use a screwdriver as a punch, wedge, pry bar or pliers. Using the tool this way can damage it and render it useless for other jobs. If the blade is bent, the handle broken or the tip twisted and dull, the screwdriver can slip out of the slot and cause hand injuries.

One key to safety here is selecting a screwdriver tip that corresponds to the screw. Workers may need to redress the tip to keep it sharp and square instead of allowing the tip to become rounded. This condition can cause injuries from the screw slipping out of the slot. Phillips screwdrivers have less tendency to slip out due to blade design.

To enhance safety when using screwdrivers, workers should be instructed to hold they should use a screwdriver with an insulated handle. This precaution decreases the chances of a short-circuit when working on electrical equipment.

When using chisels, make sure workers redress the head of the chisel after considerable use. This prevents mushrooming, which is when the head starts to spread out. When this happens, the striking surface is compromised, and flying metal filings can cause eye injuries. Workers should wear eye protection when driving implements into surfaces.

Training

The best way for managers to stress tool safety is through training, which should be incorporated into both lectures and hands-on instruction with group interaction. If required training is too time-consuming for managers to organize and conduct in-house, consider an outside provider.

Maintenance managers must make sure all workers have a clear understanding of how to work with both hand and power tools. Allow time for the workers to ask questions and provide feedback during the hands-on period or after the training session.

Also be sure workers help reinforce safety lessons so that at the end of the day, the tools are clean and ready for the next day's work. Safety must be taught at a level at which all workers can understand, and it must be done frequently to successfully reinforce the lessons.

A culture of safety.

Managers trying to cultivate a safety culture can't do it alone. It is always beneficial to have personnel who take safety seriously and can practice safety as a job in the company structure.

In many organizations, safety officers wear numerous hats, a job structure that can compromise the duty of safety personnel by taking them away from safety and forcing them to perform unrelated tasks. And in organizations where downsizing is a problem, managers should consider the benefits of working with outside experts or professionals versed in safety.

Finally, managers seeking to create a culture of tool safety in their departments may need to prompt discussions about it with the organization's human resources department and perhaps even restructure of the safety program. The goal of these and all related actions is to give departments the resources and the opportunity to protect workers and ensure smooth facility operations.

KenKen Puzzle

How to solve the KenKen puzzle:

(Answers on page 38)

- 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 is in the same row or column

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

National Pizza Month

Baseball World Series

Yom Kippur

Cosmos & Marigold October Flowers

Opal Birthstone

Cinnamon Roll Day

National Popcorn Month

Astrology Signs
Libra Scorpio

AUTUMN
Autumn Season

Breast Cancer Awareness Month

National Origami Month

Halloween

10th Month of The Year

Octopus Day

OCTOBER

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The course will be held online only using Zoom.

The fee for enrollment will cover the cost of the 150 hour course, textbooks, and BOMA certificate upon completion

please note this does not include the ABSA exam

The total cost including GST is \$2,199.75

Questions? Email Lloyd Suchet at lloyd.suchet@boma.ca for more details.

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Answers: 1)a 2)c 3)e 4)c 5)c

HIGH PRESSURE GAS SYSTEM ANSWERS:

Answers: 1)L 2)E 3)I 4)A 5)M 6)J 7)D 8)G 9)B 10)F 11)K 12)C 13)H 14)N

Kenken Puzzle Answer

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





JOIN US:

TUESDAY OCTOBER 14, 2025 AT 5PM FOR OUR
IN-PERSON MONTHLY MEETING

Title: Continuous Commissioning In The Buildings We Work In

Presenter: Les Anderson



Thorncliffe Greenview Community
Association & Recreation Centre
5600 Centre St N, Calgary, AB T2K 0T3

Bio

Les Anderson has been a Building Operator for over 30 years. In that time, he has been responsible as Chief Engineer, the operations of Highrise Buildings, Data Centers, Strip Malls and Large retail Malls. He has participated in the commissioned three New High-rise buildings and recommissioned many other facilities.

Les is an currently an Educator with BOMA Calgary and has for the last 13 years taught a five-month course with BOMA Calgary. A government approved course preparing Operators for their Certificate of Competency. As well, for the last 7 years he has been working with BOMA China in Major cities in and throughout, doing building assessments, completing BAR reports, comparing practices in place against international standards.

Les will be talking on Continued Commissioning in the buildings we work in. The importance of effective and verification of all systems under our care. To fine-tune system performance to boost energy efficiency, reduce maintenance demands, and enhance occupant comfort into tangible environmental benefits. Whether your facility is new or old does not limit the need to assure the systems are operating as specified. Most facilities when self reviewed will likely see a reduction of 2 to 4 percent in operating costs.

Les has over the last 25 years worked at Building Relationships



Why did the ghost
go to the bar?

For the boos!

RS

Just for laughs!



Why did the apple
stop in the middle of
the road?

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woman's day



Where do ghosts
like to vacation?

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woman's day

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