Volume 28 - Issue 2

BOA
Building Operators Association of Canada

Official Publication of the Building Operators Association (Calgary)

October 2021

What's Inside?

Important Phone Numbers

Emergency	911
Alberta Boiler 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

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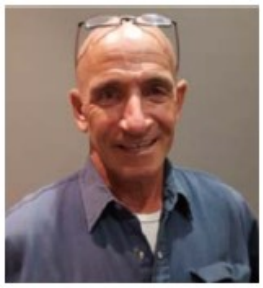
President's Message



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Building Operators Association of Canada
Building Operators Association
Box 22116, Bankers Hall
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I hope this message finds you and yours well and in good health

The Building Operators Association still is not having a live meeting for the month of October. I am hoping to have better news for the months ahead, with the opportunity to meet again. We will announce this in the magazine. I would not feel good if we became a cell for the variant to spread. I feel as frustrated as everyone else in not returning to regular meetings. We still have our meetings but in a virtual format. The Guest speakers are engaging and present interesting talks on timely topics.

The meeting last month with PMIC was very interesting. Chuck, Peter, and Carlos spoke as to where and how can Building Operators further their knowledge and be recognized for it. PMIC will soon launch their Building Operator Designation (BOD) Program later this fall, that will consist of 22 certificates in areas that industry has acknowledged needed strengthening. They also called for volunteers to assist in the building of the program.

We post all our virtual meetings on our website at, http://www.boacalgary.com to be viewed at your convenience. There will be a link provided in the magazine to register for the monthly meetings. The executives meet monthly, and the topic of "in person meetings" is discussed. Please stay tuned to the website; we will announce any upcoming changes there.

BOMA Calgary has let me know that there will be another 5th class for Building Operators beginning in the month of February. It is still not clear if it will again be a virtual event or if it will be held live, in the classroom. BOMA Calgary is investigating the possibility of continuing the education of Building Operators by assembling a Fourth-Class program. We have been successful in educating Building Operators at the 5th class level, it is only fitting that they continue this to the highest levels for facility operations. BOMA Calgary is now conducting a feasibility study with BOA Canada.

Carrissa has sent out membership invoices, please pay as we need your support.

The next virtual meeting is October 12th at 5PM, MST. Please register.

So, take care of yourselves and please, be kind to one another.

With kind regards,

Les Anderson PE, RPA

zoom

JOIN US!

FOR OUR VIRTUAL BOA MONTHLY MEETING ON TUESDAY OCTOBER 12 2021 AT 5PM

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 15

1. An operating control switch for an on-off boiler:
a. uses a differential spring to reduce cycling
b. can only have its cut-in setting adjusted
c. has an un-adjustable span between cut-in and cut-out
d. utilizes a resistance coil
e. operates in conjunction with a modutrol motor

2. Combustion air safety switches are commonly found:
a. on natural draft boilers
b. on hot water boilers only
c. on boilers utilizing a forced draft fan
d. on gas fired boilers only
e. as non-interlocking devices and take no part in a startup

3. In view of heating boilers, a low fire switch:
a. is a type of manual over-ride
b. takes no part in the start-up of an automatic boiler
c. is a normally closed switch
d. utilizes a thermal element for its operation
e. acts as an interlock to ensure minimum damper setting

4. Modulating burner controls operate by regulating:
a. steam flow and fuel flow
b. fuel temperature and air flow
c. fuel flow, air flow, and feedwater pressure
d. fuel flow, and air flow
e. fuel flow, and atomizing steam flow

5. Modulating combustion controls:
a. regulate the steam and feedwater supply
b. regulate fuel and air supply
c. control the oil atomizer
d. control the back draft damper
e. control the draft and feedwater temperature

6. On a multi-burner boiler the high fire nozzle will:
a. be in operation on start-up
b. operate continuously when steam demand exceeds boiler capacity
c. be ignited by a pilot flame
d. respond to electrical resistance
e. operate regardless of where the manual over-ride switch is set

Morning Meetings: Maintenance Planning and Scheduling

by Christer Idhammar

All over the world, most plants have morning meetings. As a consultant, I have been asked to sit in on many of these meetings, and my conclusion from these experiences is that most of them are not very effective or meaningful to the attendees.

First of all, the focus of the meetings is often on past events. For example, each department reports what happened yesterday, and very little time is spent on today's plans. In addition, even less time is spent on activities that must take place tomorrow and beyond.

The worst-case scenario

Let me tell you a little about the least effective meetings I have attended by describing a generic case. At this meeting, the room is noisy, people have to stand up because there is no place to sit, and there are no visual aids such as an overhead projector, flip charts or a white board.

In addition, the leader of the meeting does not lead the meeting at all and often speaks with a low voice, making it impossible to hear. Attendees receive the latest production report and are asked – one by one – to read the part for which they are responsible. At this point, it is common to see that people do not listen to parts of the production report that do not directly apply to them. In addition, when they read their own parts, others do not listen to them either.

In the very worst scenarios, maintenance craftspeople do not start working in the morning until they have talked with their supervisor. This often causes a delay in work because the supervisor attends the morning meeting at 8 a.m., while the crew arrives at 7 a.m. The crew has learned, from long experience, that job schedules and work assignments are frequently changed as a result of the morning meeting. Therefore, they wait until the supervisor comes back from the morning meeting around 8:30 a.m. to begin work for the day.

Creating more effective meetings

To improve the effectiveness of your plant's morning meetings, I propose that you ask yourselves some of the following basic questions:

- Why do I attend the meeting?
- Do I attend because our plant has always had those meetings every day at 8 a.m.?
- Do I attend because this is the most efficient way for the organization to receive information about what happened last night?
- What do other attendees expect from me, and what do I expect from them?
- Is there a way I can improve communication at these meetings? For example, could I prepare my part of the presentation with charts and other visual aids and hope that others follow the example?
- Do we need to have these meetings every day, or would it be enough to have them on Mondays and Fridays?

Do we need to have these meetings in the morning, or could we move it to mid-day and then focus on tomorrow's activities?

Effective meeting characteristics

Some very effective meetings I have attended share some of the following characteristics:

- The leader leads the meeting, and he or she can be distinctly heard throughout the entire room.
- The meeting starts on time and ends on time.
- Visual aids are used, and only information

Continued on page 8...

meaningful to the majority of the attendees is presented. Especially effective meetings present all their information using Power Point or other presentation software projected on a large screen.

- The meeting focuses on communicating important information, describing recent results and defining problems that must be solved.

Each meeting includes a three- to five-minute teaching/discussion break.

No meetings?

Personally, I believe it is good to have meetings if they are productive, and it is a given that attendees must include operations and maintenance people at a minimum. If the purpose of your meetings is to spread information, you can sometimes accomplish this using internal televisions and computer networks. With those capabilities, you can possibly have fewer meetings.

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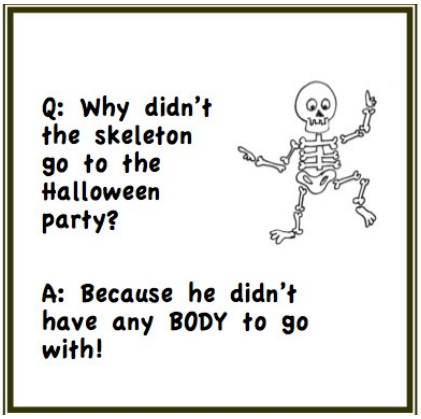


Make the Most of Motors

By

Thomas A. Westerkamp

Improving efficiency requires rethinking inspection, testing, and maintenance procedures, as well as planning effectively

Motors and drives are among the most important components of any facility's efforts to control energy use and ensure the smooth HVAC system operation. But organizations cannot achieve these goals without a comprehensive program of motor and drive inspection, troubleshooting and maintenance.

The U.S. Department of Energy (DOE) estimates that there are more than 12.4 million motors greater than 1 hp in service. Of these, nearly 3 million fail annually, resulting in 600,000 replacements. The remaining motors are repaired.
Motors consume more than 600 billion kW annually, so the percentage increase in energy efficiency through use of premium motors will have a huge impact on energy use. A closer look at motor and drive components that commonly cause problems, along with a discussion of problems technicians can look for, can help managers develop strategies that will benefit their organizations' bottom lines.

Problems and causes

The components of motors and drives that most commonly cause problems fall into three categories: switchgears, motors, and connected loads.

Switches tend to overheat due to the presence of dirt, abrasion, moisture and heat, and distribution wiring is affected by the same environmental stresses, as well as by motor loads. Motors also are subject to ambient conditions and loads.

Motor components that fail often include bearings, seals, contact, windings, commutators, brushes, rings, shafts, couplings and coupling inserts. Drive failures include gears, bearings, shaft seals, bushings, shafts, contaminated oil, belts, and pulleys.

The biggest enemies of motors are dirt, heat and moisture because they cause excessive vibration that often is the immediate cause of a motor mechanical failure.

A single-phase winding failure causes an opening in one phase supplying power to the motor. Causes of an opening include: damaged power distribution lines; open, oxidized or pitted contactors; and bad fuses or connections.

A motor's insulation can fail due to ambient heat, abrasives or other airborne contamination, vibration, and a voltage surge. Motor nameplates show degrees temperature rise, which gives technicians an indication of the motor's tolerance for heat.

Vibration can also generate heat and can be electrically caused by uneven voltage between phases resulting from unbalanced power-distribution-system loads, contacts with high internal resistance, and failing or loose terminal connections.

If all three phases are hot, it is probably due to an overload, where actual amps exceed full load amp capacity of the motor. Technicians can consult National Electrical Manufacturers Association (NEMA) standards for motors.

Under- or over-voltage can be beyond a motor's tolerance range. Problems also can arise from very high locked-rotor currents due to connected load failure or excessive starts or reversals.

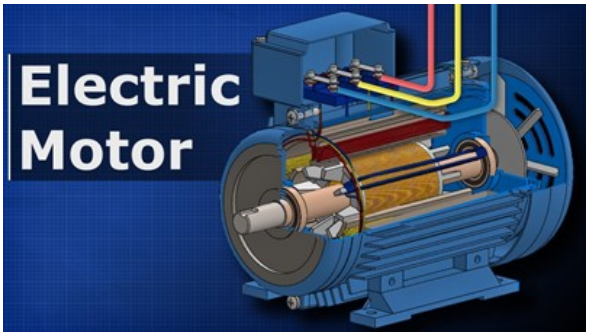
Taking stock

The first step in scheduling maintenance tasks for motors and drives is to inventory equipment in the field and the applications for which they are used. Since the preventive maintenance (PM) and other routine maintenance vary by type of motor, managers will need to know how many of each type are in place.

The most common types include:

- single-phase induction, usually in the 120-volt range
- three-phase induction motors, with 220/440 volts synchronous motors.

The types of starters and fused switches will vary by type and size of load. The process of identifying these components might be as simple as running a report from the CMMS equipment module, if one has been developed. Or can be as complicated as assigning technicians to go out and physically find each unit and record the information off the nameplate.



The maintenance manual for each specific type of motor is an excellent source for a description of inspection, testing and lube tasks, as well as their frequency. The vendor or manufacturer will gladly supply the manuals if they are not available in house.

Inspection guidelines

A good first step in motor-inspection program is to inspect external area and surfaces for trouble signs, such as leaking grease or oil, dust, dirt or water accumulation on or near the unit, noise — which might indicate excessive vibration or slipping belts — and heat, which is the enemy of insulation.

Among the tests that technicians can use to determine motor and drive condition are: using voltmeters, meg-ohmmeters, and ammeters; vibration analysis; infrared imaging; and oil analysis.

Ammeters, or tong testers, measure actual current. Technicians can take the results of an ammeter test and compare them to nameplate full-load current rating, which shows balance between phases and overload conditions.

Vibration analysis show mils of vibration at selected rpms and indicates any wear or imbalance that might shorten motor life. Technicians can tell if the vibration is due to electrical or mechanical causes by shutting off the motor.

If the vibration stops while the motor is coasting, the cause is electrical, a result of current flowing across a rotating part, such as a bearing, generating an electrical field. If the vibration continues, the problem is mechanical — possibly bad bearings or a bent shaft.

Oil analysis can identify the conditions in a gearbox driven by the motor. Cuttings in the oil sample indicate wear in the gears that also can damage bearings. External checks of belt drives — a visual check for dirt and oil leaks and an audio check for slipping or vibration noise — will disclose need for repairs. Belts stretch over time, and if technicians do not adjust them, the bests will wear due to abrasion, which also can cause unnecessary wear on pulleys and sheaves.

What technicians find on the outside indicates whether the motor or drive needs further examination — disassembly and internal inspection inside — and even repair to be scheduled when the equipment is out of service.

Internal checks of switchgears should include visual checks of fuses and contacts inside switch boxes for looseness, pitting and oxidation. Using thermal-imaging equipment, technicians can make these checks without shutting down the equipment.

Thermal-imaging tests will identify hot spots, and technicians can schedule a shutdown to clean components with emery cloth and contact cleaner or to replace fuses and contacts, to eliminate the hot spots. This procedure also reduces loads so the equipment becomes more energy-efficient.

Internal visual and relay-test motor checks — actual disassembly and inspection — will identify dry or cracked insulation, dirty windings, and loose parts, such as brushes, bearings, coils, and commutators.

If PM testing and inspection indicate the need to replace a motor, selecting a premium-grade replacement is the best strategy because each such replacement upgrades energy efficiency and reduce the overall electrical load. If facility executives are to support maintenance and engineering efforts to develop a good motor maintenance plan, they must be aware of the results of these efforts. An accurate and complete equipment history will show the benefits to the organization, including higher reliability and lower energy cost.

Some managers started a motor and drive management program to prevent unexpected downtime. Instead, they ended up with that result, as well as energy savings as a bonus. They found that reduced service interruptions more than paid for the investment in premium motors, better PM coverage, and state-of-the-art testing equipment.

Planning for motor maintenance

As a part of a motor management plan, it is essential to have all tasks — including switchgear, motor and drive testing and inspection — included in the department's preventive maintenance (PM) program. These steps can ensure that all tasks are covered:

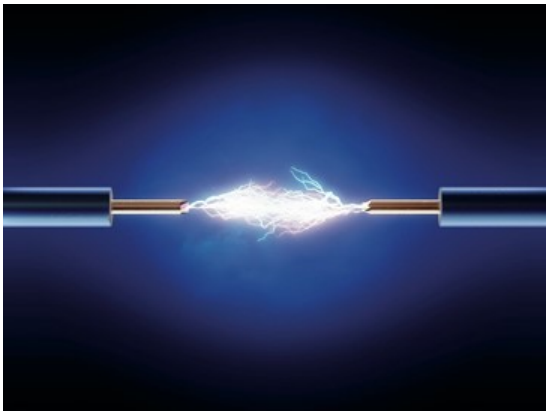
- Plan the task method and time.
- Associate each equipment item with the task.

Schedule each equipment/task combination on an annual schedule calendar that shows start date and frequency.

Managers who assign a time to each motor-inspection task also can use their plan to more accurately determine the number of maintenance hours planned annually and the level of staffing is required to carry out the plan effectively.

For example, assume that one test and inspection or replacement requires 11/2 hours and a technician performs the task once a month on 100 motors. In this case, the annual time required is 1,800 hours — 1.5 hours times 12 occurrences times 100 motors — which is a little less than one person working full time — 40 hours a week times 50 weeks a year equals 2,000 hours.

Comparing planned times to actual time spent also provides managers with a measure of performance. Comparing scheduled activity with



completed activity gives managers an indication of schedule compliance — how many PM tasks are completed versus the number of tasks scheduled. This critical information enables managers to more effectively evaluate and improve the program, focus motor management training where it will do the most good, and aid supervisors to fully use and develop their crews.

Thomas A. Westerkamp

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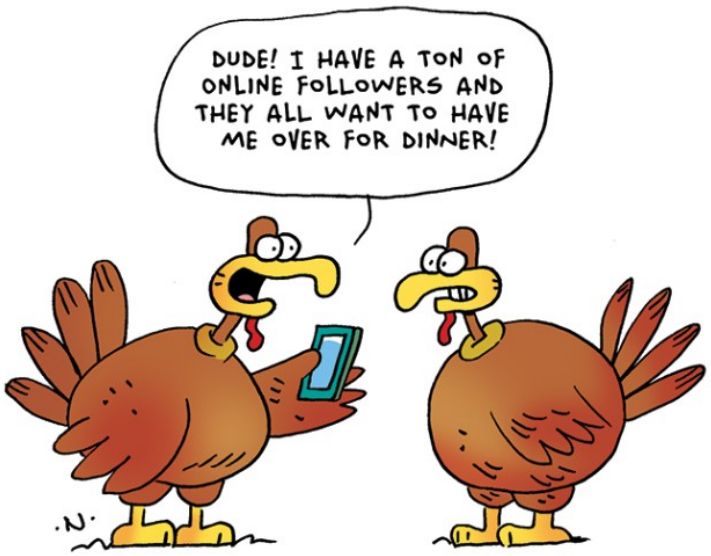
KenKen Puzzle

How to solve the Kenken puzzle:

(Answers on page 15)

- 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

11+	12×	5−		2÷	4
		8+	16+		3÷
3					
3+	5−		1−		11+
	5	1−		144×	
5+		5			



WHAT IS AN ENERGY AUDIT?

BY

Alberto Quiroz

An energy audit is an inspection and analysis of energy usage of a commercial or residential building to conserve energy. It is the first step in identifying opportunities to reduce carbon footprint and energy costs in commercial real estate properties.

The primary goal of a residential building is to reduce energy consumption while maintaining or improving comfort, safety, and health of tenants. Besides identifying the sources of energy use, the purpose of an audit in a building is to prioritize the energy usage from the most to least cost-effective possibilities of energy savings.

An Audit identifies various facility upgrade opportunities and can be used as an effective planning tool to ensure the energy usage savings are made and sustained in the long term. The aim is to have all defined improvement projects "payout" in two to four years, which converts to a ROI of between 25 - 50%. A common expected starting point of an accredited Energy Audit results in recommendations for savings between 5 - 25%.

Cathy Zheng a Professional Engineer in Ontario and Energy Auditor with CZ Consulting indicates; "In the nutshell; an energy audit is a recommended first step planning tool, that provides a road map for the management (financial and operation) to decide where to invest their capital next."

ENERGY AUDIT PHASES

There are typically three phases to an Energy Audit, depending on requirements:

1. INVESTIGATION PHASE
2. MONITORING PHASE
3. ANALYSIS & REPORTING PHASE

The auditor looks at the energy efficiency of the building related to the production/ output, emissions, power tariff, ABGR energy star rating, and peak demand management.

TYPES OF ENERGY AUDITS

1. A WALK-THROUGH AUDIT

These audits are typically undertaken for smaller sites with lower energy spending. It provides an overview of energy performance and identifies low-cost energy saving opportunities.

Type 1 audits are meant to assess building energy efficiency and determine areas of possible improvement as well as the need for other kinds of audit. This kind of audit is primarily based on visual verifications from

specialists and a detailed study of the equipment, energy consumption patterns, and basic operating data. Type 1 audits can usually be completed in a month.

2. DETAILED/ GENERAL ENERGY AUDIT

General energy audits include an analysis of energy performance to identify opportunities for a site in detail. It provides a detailed savings and cost analysis for identified projects using calculated energy usage according to the size, load, efficiency, hours, etc.. It is the most popular audit type for properties. Type 2 audits are generally completed in 2-3 months and need to be revised every 3-5 years.

3. INVESTMENT GRADE AUDIT

Audits of this type are usually focused on one process or subsystem level, such as compressed air or lighting or building management systems, rather than a whole site.

Investment Grade audit is a longer process because large amounts of energy data over multiple shorter periods are used to track energy usage at a granular level. These audits are most suitable for big buildings as they offer the highest accuracy and are done with a specialized modeling software. Time frames for are typically a minimum of 6 months but vary based on the needs of the client. These audits include onsite measurements to monitor energy data over a period long enough to identify various operating conditions and relevant variables.

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13 Inspiring Traits of Exceptional Leaders

1. They trust you to do the job you've been hired to do.
2. They seek your advice and input.
3. They find opportunities to let you shine.
4. They recognize your contributions.
5. They have your back during tough times.
6. They are master storytellers.
7. They challenge you to do bigger and better things.
8. They express appreciation.
9. They are responsive.
10. They know when to apologize.
11. They give credit where credit is due.
12. They treat others with dignity and respect.
13. They care.

Glenn Leibowitz

Kenken Puzzle Answer

11+ 5	12× 3	5− 6	1	2÷ 2	4 4
6	4	8+ 2	16+ 5	1	3÷ 3
3 3	2	4	6	5	1
3+ 2	5− 6	1	1− 4	3	11+ 5
1	5 5	1− 3	2	144× 4	6
5+ 4	1	5 5	3	6	2

TEST YOUR OPERATOR IQ ANSWERS

Answers: 1) a 2) c 3) e 4) d 5) b 6) b

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The last word on…
Elevator Safety

by Cindy Schweich Handler

There are about 600,000 elevators in Canada. Every once in awhile, you get in a car that shudders, misses the next floor, or suddenly speeds up or slows down. It makes you wonder - *Should I trust this contraption?* "Statistically, it's a safe ride," say Ray Lapierre, executive director of the Elevator Escalator Safety Foundation. Out of an estimated 120 billion rides per year, about 10,000 people end up in the emergency room because of elevator-related accidents. Their injuries are most often caused by tripping or being hit by closing doors. In some cases, accidents have occurred when the doors opened onto an empty shaft. As for the odds of getting stuck in an elevator. They're about once in a lifetime for the average person using elevators on a daily basis. Still nervous? Here, answers to common questions about elevators misbehavior.

How do I know if an elevator is safe?

The vast majority of states and cities abide by the A17.1 Safety Code for Elevators, which calls for a minimum of semi-annual inspections by certified elevator inspectors. A certificate listing the last date of inspection should be hung in each elevator (or it should be available in the superintendent's office); if you don't see one, or if you notice that the date listed is more than six months old, contact the building's superintendent, or notify your local elevator inspection bureau and take the stairs.
Could the cable snap and send an elevator plummeting down the shaft?

This is every rider's worst fear, but experts say there's no need to worry. You're being supported by four to eight cables, each of which could support the weight of the car by itself. In fact, the only time an elevator has been known to go into freefall - with all of its cables cuts - was during World War II, when an American bomber accidentally hit the Empire State Building. The plane's crew died, but the lone elevator passenger survived.

If the car bounces, is that bad?

Hydraulic elevators, used in buildings of two to five stories, move when oil is pumped through a cylinder. lifting the cars up or letting them down the same way they're raised and lowered in an auto-body shop. Older elevators may jerk when the oil hasn't warmed up enough (usually early in the morning). While a less-than-smooth ride can be nerve-racking, it's not a safety concern.

Traction elevators - in buildings with six stories or more - use an electric motor, counterweight, and pulley to move the car. They might bounce because of poor brake adjustment. "This occurs with normal wear and tear," says David Afmuth, vice president of

National Elevator Inspection Services, " but it doesn't pose an immediate danger to riders." You should however, tell your building superintendent so that the brakes can be adjusted to prevent more serious problems in the future.

Am I in danger if it suddenly seems to speed up?

Traction elevators may briefly accelerate during power surges or when the pulleys are worn (something inspectors look for when checking elevators). Sounds scary, but there are several back-ups in place. If the car moves beyond a certain speed, an electric switch automatically shuts off the elevator. If that doesn't work, "safeties" (mechanical devices attached to the bottom of the car) automatically apply brakes to the side rails and bring the car to a halt.

What about when it moves too slowly?

This is a probably caused by dirt or wear on acceleration switches located in the building's control room. Though a sluggish ride can be annoying, lack of pick-up doesn't mean, however, that the elevator needs tending to, so inform your building superintendent.

Should I get in an elevator that isn't level with the floor?

"If an elevator arrives empty and is uneven with the floor, it needs mechanical adjusting," says Afmuth. "But it's no more likely to get stuck or crash."

An older car that's crowded with people may sink slightly below floor level due to the extra weight (newer elevators are equipped with load-weighting equipment that will automatically prevent the doors from closing). While elevators are designed to carry more than the maximum weight posted, if the car's over-crowded, it's a good idea to wait for the next one.

Tips for the trapped:

- Don't panic. Take a few deep breaths and remind yourself that there's plenty of oxygen in the car. Then do whatever makes you feel comfortable - hum your favorite tunes, do stretching exercises, read any books or magazines you may have with you.
- Contact the outside world. Every elevator should have an alarm button and intercom or phone. In large buildings, an on-site custodian should respond to your call within five minutes.
- Sit down. Some people have fallen when the elevator suddenly restarted.
- Don't worry about being in the dark. Lighting runs on a separate circuit. Even if it does go out, there is a back-up system that would kick in for up to four hours.
- Stay put. Never attempt to pry open the doors or crawl out of the opening on the roof of the car. The elevator could start moving again - with fatal results. Wait until qualified mechanic or rescue personnel come to your aid.

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September Meeting Minutes			
Chaired by: Mark Arton	Minutes by: Monika Bhandari	Call to order: 5:01pm	Webinar: September 14, 2021

- **Introduction from Mark Arton**

- **Guest Speakers**: **Chuck Nervick - MediaEdge Communications Inc., Snr. VP**
  Peter McHardy - PMIC Chair
  Carlos Alonso - Director, Learning and Program Development, MEC Real Learning Inc.

  Topic: **Building Operators, are we a trade or a profession?**

New Business:

- Online/virtual meetings will continue for the time being
- Will send gentle reminders for payment of membership dues; please support us!
- BOA Tradeshow postponed until May 2022
- More webinars to be presented possibly a few a month—share your ideas with BOA Executive
- Visit the website for YouTube videos of last meetings; download BOA Magazine from www.boacalgary.com
- Next virtual (zoom) meeting on October 12, 5pm
- Balance is $5883.78

JOIN US: TUESDAY OCTOBER 12, 2021 AT 5PM FOR OUR VIRTUAL MONTHLY MEETING

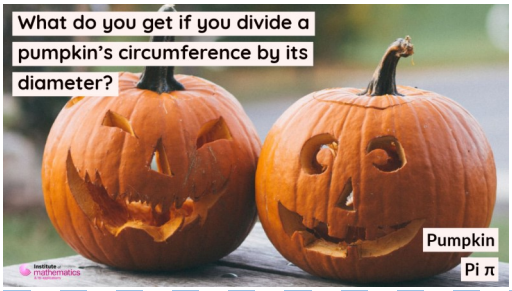
Title & Brief: **tekmar Controls - Product & Application Guide Review for Building Operators**

tekmar Controls is a Canadian product line of heating system controllers and sequencers commonly used in both small and large buildings. They are typically used for the control of heating boiler systems, heating pumps, domestic hot water systems, and snow melt systems.

Guest Speaker: **Eric Balt, Technical Sales Manager at tekmar Control Systems Ltd.**

Click on the link to register for the BOA Monthly Meeting

Just for laughs!



LOL

Who is not hungry at Thanksgiving?

The turkey because he's already stuffed!

GH

BOA CALGARY OPERATOR MAGAZINE ADVERTISING RATES:

1/8 page	$200	**Premium Locations:**	
1/4 page	$400	1/2 page inside/outside cover	$850
1/2 page	$775	1/2 page outside cover	$900
Full page	$1000		

Deadline for ads is the 10th of each month. For any questions, please email: advertising@boacalgary.com.

BOA Building Operators Association of Canada

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