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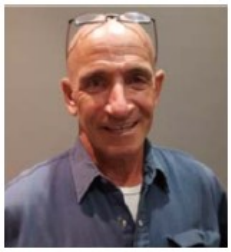
President's Message



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Building Operators Association
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www.boacanada.ca

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

What a great turn-out to the Trade Show. It was a success, and it is great that there was still interest in getting together. It was so nice to see you there. For those of you who missed it, it will be two years until the next one. The keynote speakers presented timely and informative topics. Again, if you missed it, you are in luck we recorded them and put them on our website for viewing. The vendors had great products to show us, and I was amazed at what is going on in the industry. It is at these events that all of us can take the time to meet one another and view items specific to our industry. I am sad it took so long to do this (stupid Covid) but we got it done and many thanks to Mark Arton for organizing the guest speakers. Thanks to the help of Monika Bhandari for the camera work and Leonard Magdalang and Val Firan for so much help.

We were asked by some vendors, those who had a booth and those who we had to turn down due to the venue being full, to do this Trade Show every year. This is a lot to ask from a small volunteer group. Please share your thoughts about this. Maybe you would like to volunteer?

Membership fees are due, and I hope you still want to belong. It is important that you believe that we bring value to our industry. Not only does our commitment to the association matter, but it also means even more if you are committed to the association as well. Please join us at the meetings and see the value. Your paid membership dues help us to meet our operational expenses.

BOMA has committed to putting on a 5th class course in the new year. Presently there is a shortage of qualified people in the city to run the buildings and we have a need to certify more people. BOMA has an ABSA qualified course. If you are thinking of upgrading your skillset or know someone who wants to make a change please call BOMA at 403-237-0559 and register. ABSA has made it easier for people to enter into this discipline. No firing time needed until you receive your pass mark from ABSA. TQ is issued once you have 6 months experience after passing the Government exam.

I hope you come to the next meeting November 8, 2022

Smiles))

With kind regards,

Les Anderson PE, RPA

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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 sounds control and a sound investment.
Try our monthly Operator IQ challenge...*answers on page 27*

1. A float operated mechanical feeder valve should:

a) be a normally closed valve
b) open just after the low-water cutoff switch opens
c) be located above the water column
d) not be deemed a stand-by device
e) not open until the level is well below the feed pump cut-in level

2. A Hartford loop will:

a) eliminate the need for venting a steam heating system
b) ensure continuous circulation of a hot water system
c) prevent steam from entering a steam pressure gage
d) prevent boiler water level from going below the LPWL
e) prevent the draining of an expansion tank

3. An electric feeder valve will:

a) eliminate the need for a low-water fuel cutoff
b) prevent a low-water trip
c) require manual action to open
d) open after the unit trips on low-water

4. Because of variations in flow rate, nearly all large steam heating plants utilize:

a) an economizer
b) a deaerator
c) a condensate receiver
d) multiple boilers
e) steam pressure regulating valves

5. Dissolved oxygen in condensate:

a) will cause pitting in a boiler
b) may use pitting on the return lines
c) causes grooving of the condensate lines
d) cannot be removed with chemicals
e) necessitates the installation of a deaerator

Indoor Air Quality

by Duncan Murray

Indoor Air Quality or IAQ has a direct relationship on employee health and work performance. IAQ issues tend to be complex in nature:

- Ventilation systems that are not designed to deal with the capacity of the building
- Ventilation system that is in dire need of maintenance
- Building design efficiency does not allow enough ventilation
- Poor location of inlet air ducts that allow exhaust to enter into the building
- Indoor mould growth

Lack of ventilation of office equipment such as photocopiers, printers etc.

"With respect to IAQ, Alberta's Occupational Health and Safety (OH&S) legislation requires that workplaces be healthy, but it does not require that workplaces be comfortable. However, there are good reasons, such as enhanced staff moral and productivity, to exceed the legislated minimum requirements."
(Alberta Human Resources Workplace Health and Safety Bulletin General Health - GH014 September 2003)

As a general guide maintaining IAQ requires adequate ventilation, temperature, humidity and minimum airborne contaminants.

Adequate Ventilation

Monitoring carbon dioxide (CO2) is an excellent indicator of air exchange. As the concentration of persons in the building increases so does the concentration of CO2. Outdoor air concentrations contains approximately 300 to 400 parts per million (ppm) CO2. As the "load" or population of the building increases so does the CO2 level and the air begins to get stale. Concentrations of 2,500 ppm to 5,000 ppm can cause headaches. Levels of 100,000 ppm (10 percent) people lose consciousness in ten minutes, and at 200,000 ppm (20 percent) CO2 causes partial or complete closure of the glottis or the space between the vocal cords.

Levels of 2,500 ppm do not normally occur in structures and since CO2 is produced by people this is an excellent indicator on the air quality of a building during the normal workday. Building engineers and operating systems monitor the CO2 content as it increases so does the frequency of air exchange. (See below)

Change to liters per second
The American Society of Heating Refrigerating and Air-Conditioning Engineers, Inc. publishes (ASHRAE Standard 62-1989, Ventilation for Acceptable Indoor Air Quality.) This standard specifies that the minimum ventilation rate per person is 15 cubic feet per minute (cfm) or 7.05 liters per second (lps) of outdoor air. Higher rates are in place for specified applications, i.e., the minimum rate is 60 cfm or 28.2 lps for a smoking lounge, 20 cfm or 9.4 lps for a school training shop, and 30 cfm or 14.1 lps for a hospital operating room. Residential dwellings are covered by a special specification, which is 0.35 air changes per hour, but not less than 15 cfm/person.

To determine ventilation rates, the CO2 levels inside and outside the building must be measured in parts per million (ppm). The ventilation rate is equal to the value 10,500 divided by the difference in indoor and outdoor CO2 concentration. The ventilation rate will be in cubic feet per minute (cfm) per person. In Canada it is liters per second per person where the final figure is multiplied by .47.
Example:

The indoor concentration is 1,000 ppm
Outdoor concentration is 300 ppm
Difference is 700 ppm
10,500 divided by 700 yields 15 or a 15 cfm ventilation rate per person.
15 X .47 = 7.05 lps

It should be noted that this equation assumes that there is a uniform density of persons, no source of combustion and all persons are engaged in light activities.
It is a general guide to attempt not to exceed 1,000 ppm of CO2.

Air Temperature
A standard "comfortable" air temperature for most persons is 22 degrees Celsius. Persons involved in physical labour or activity usually desire it cooler whist those in offices prefer it to be slightly warmer. A general guide for office temperatures is 22 Degrees Celsius.

There are six main factors governing perceived temperature:
1. Actual Air Temperature: This is the measurable temperature; it is also the least important under hot conditions.
2. Air Speed: Also known, as wind speed is the movement of air that will cool the skin. Most important during the winter where it can drop the air temperature rather dramatically.
3. Humidity: This deals with the amount of moisture in the air. The higher the humidity the less cooling of the skin during hot weather. Also the higher the humidity the more energy it takes to cool the air and the lower the humidity the more energy it takes to warm the air. That is one reason why some buildings humidify their air during winter months.
4. Physical Activity: Again the more physical a person is the more energy the give off and the more cooling they require. It should also be noted the less movement a person has the cooler they feel and it too can lead to serious medical conditions as well as death in extreme cases. In one instance a lady reported that her office would be very cold early in the afternoon. After placing scientific thermometers in different locations it was found the temperature had not changed. Yet she perceived that it had, upon interviewing her it was noted that she normally worked at her desk and even lunched there. It was recommended that she take a break every couple of hours moving around her department to prevent "blood pooling" after a couple of days she felt better and had no complaints.
5. Radiant Heat: This can be from sunlight, hot water heating system and equipment as well as other people.
6. Clothing: This makes the difference! Layers or type of clothing can trap heat in or keep heat out. If you are too warm then take some off or in the winter dress for the weather.

There are many other factors including health status, body weight, hydration, age, use of prescription and non-prescription drugs as well as fitness can effect how a person may senses or feels temperature. *Again "With respect to IAQ, Alberta's Occupational Health and Safety (OH&S) legislation requires that workplaces be healthy, but it does not require that workplaces be comfortable. There is currently no legal minimum or maximum limit of air temperature that workers may be exposed to. According to current legislation, an employer is expected to ensure that workers do not experience adverse health effects resulting from heat or cold stress."*
(Alberta Human Resources Workplace Health and Safety Bulletin General Health - GH014 September 2003)

Humidity
This is extremely important to the operations of a building and how tenants feel. Comfortable

humidification levels range between 30 and 60 percent. During the winter the humidification is raised thru steam injection at the air supply to the building. With raising the humidity, it also helps to warm or heat the air. Less humidity in the air requires less energy to cool it and the more humid the air is the less energy is required to heat it.

Mould

Small amounts of mould are present most of the time. Normally this is not a problem or hazard however too much exposure to any substance can be harmful. Excessive levels can occur when there has been water damage from flooding, sewer backup or seasonal water leakage or condensation.

There is not currently a specific legal limit of airborne mould that workers may be exposed to. According to current legislation, an employer is expected to ensure that workers do not experience adverse health effects from mould exposure. This general guide is based on Health Canada and New York mould guidelines. See referenced bulletin BH018 for detailed references. (Alberta Human Resources Workplace Health and Safety Bulletin General Health - GH014 September 2003)

Chemical and particulate Contaminates

Some of the more common IAQ contaminates are: Carbon Monoxide, Ozone, Cigarette Smoke, Vehicle Exhaust, and Formaldehyde.

Carbon Monoxide is the result of incomplete combustion of fossil fuels. This can come from poorly maintained heating systems, gas fired appliances or exhaust entering the building. Motor vehicle exhaust can enter a building thru loading docks, fresh air inlets. Ozone is produced from electrical equipment such as photocopiers. Formaldehyde is the result of off gassing from new materials such as plastics, carpeting, particleboard even newly printed reports and pamphlets.

Health Canada has a set guideline limit for Total Volatile Organic Compounds at 5 mg/m3.

See: http://www.hc-sc.gc.ca/hecs-sesc/air_quality/pdf/93ehd166.pdf

Dust

There are numerous sources for dust. Dirt being tracked into a building from persons who cannot wipe their shoes, handling paper, poor air filtration as well as other sources. Good housekeeping such as wet mopping, wiping and vacuuming helps to mitigate dust accumulation.

As a general guide total dust for an office environment is not to exceed 100 micrograms per cubic meter of air.

Allergens

Allergies or sensitivity to something sometimes bring devastating results. Common substances that may produce allergic reactions include: Perfumes, pollen, animal dander, cigarette smoke even the smell of peanut butter. It is strongly recommended that the use of scented candles, incense as well as cleaning products be kept to a minimum to prevent any reactions.

There is not currently a specific legal limit of allergens that workers may be exposed to. According to current legislation, an employer is expected to ensure that reasonable and practicable measures are taken to ensure that workers do not experience adverse health effects resulting from exposure to allergens.

(Alberta Human Resources Workplace Health and Safety Bulletin General Health - GH014 September 2003)

Lighting

One of the most important "comfort perceptions" is lighting. This greatly affects a person's perception of IAQ. As a general guide levels between 500 and 750 LUX is required for offices. Computer lighting on the other hand is between 300 and 500 LUX. An architectural design for fluorescent office lighting normally calls for tubes that burn between 3500 and 4100 degrees Kelvin.

Over a period of two years the author has conducted numerous tests. Suffering from migraines he changed some of his lighting to 6500-

degree T8 tubes. With the permission of some of his tenants he changed their office lighting using varied configurations and tubes.

After testing it was found that replacing one tube in each fixture with a 5000 K bulb and using two 3500 K bulbs reduced the amount of glare from paper as well as monitor screens. A number of persons who also suffered from eyestrain thru the day also had their lighting changed. They too reported feeling a difference and at the end of the day felt better.

Noise

Noise and background noise can also affect a person's perception of IAQ and their comfort.

- General office noise should not exceed 48 dBA
- Private office noise should not exceed 45 dBA
- Board room noise should not exceed 40 dBA

Employer responsibilities

Alberta's Occupational Health and Safety Act lays out the employer's responsibility to ensure the health and safety of workers at the work site. Regulations or Codes under this act have been established to define standards related to protections from specific hazards.

In Alberta, workers must not be exposed to airborne levels of chemical contaminants above their Occupational Exposure Limit (OEL) if there is one established, or as low as reasonable practicable if an OEL has not been established. It is important to note that OELs represent minimum standards for worker protection. All reasonable and practical efforts should be taken to keep exposure level as low as possible.

OELs are reviewed periodically. Please check Alberta's occupational health and safety legislation for the current requirements.

Worker responsibilities

The Alberta's Occupational Health and Safety Act places responsibilities on workers for health and safety at the work site. The Act and regulations require workers to take reasonable care of themselves and others at the work site. This includes co-operating with the employer for the purpose of protecting themselves and others."

Article reprinted with permission

Hybrid Lighting Technology Gaining Momentum

by Reliable Plant Magazine

With five hybrid solar lighting systems already in place and another 20 scheduled to be installed in the next couple of months, the forecast is looking sunny for a technology developed at the Department of Energy's Oak Ridge National Laboratory.

Preliminary data from field units, which collect sunlight and pipe it into buildings using bundles of small optical fibers, shows potentially significant energy savings in lighting and maintenance costs. An added benefit is that, for most uses, natural light is vastly superior to artificial light.

"This is the ultimate 'green' technology," said Duncan Earl, a co-developer of the technology and chief technology officer of Oak Ridge startup company Sunlight Direct, which licensed the technology from ORNL last year. "In fact, we have received many inquiries and are working with several organizations that are aiming to build LEED-certified buildings."

The U.S. Green Building Council established the LEED (Leadership in Energy and Environmental Design) designation for buildings that comply with a national consensus standard for design and construction of "green" buildings.

The hybrid solar lighting technology uses a rooftop-mounted, 48-inch-diameter collector and secondary mirror that track the sun throughout the day. The collector system focuses the sunlight into 127 optical fibers connected to hybrid light fixtures equipped with diffusion rods visually similar to fluorescent light bulbs. These rods spread light in all directions. One collector powers eight to 12 hybrid light fixtures, which can illuminate about 1,000 square feet. During times of little or no sunlight, a sensor controls the intensity of the artificial lamps to maintain a constant level of illumination.

Over the next several months, researchers in ORNL's Solar Technologies Program will continue to perform beta testing of the units, installed or being installed at various locations around the nation.

"As part of ORNL's Sunlight Inside Initiative, a field-trial demonstration program, we will be gathering energy, cost and reliability data and publishing a report," said Melissa Lapsa, manager of the lab's Solar Technologies Program.

The system can save approximately 6,000 kilowatt hours per year in lighting and another 2,000 in reduced cooling needs for a total of 8,000 kilowatt hours annually, according to Sunlight Direct estimates. Over 10 years, for parts of the country where the utility rates are 10 cents per kilowatt hour, that can result in savings up to $8,000 per hybrid solar lighting unit. For large floor spaces – 100,000 to 200,000 square feet – this translates into energy cost savings of between $1 million and $2 million over 10 years, according to Sunlight Direct. Operation and maintenance savings could account for another $300,000 in savings over the same period.

"The great thing about hybrid solar lighting is that we're getting peak light output during the time when there's the greatest demand for electricity," said Bill Lekas, energy manager at San Diego State University. "That saves us energy during the part of the day when electricity costs the most, and the reduced demand could reduce the incidents of rolling

brownouts."

If market projections prove accurate, within five years 5,000 hybrid solar lighting systems could be installed in regions of the nation where solar availability and electricity rates make this technology cost effective, saving 50 million kilowatt hours per year. Retail applications are the most likely first market for this technology, Sunlight Direct's Earl said.

The challenge over the next 18 months is to reduce the cost from about $12 to $4 per square foot. With larger collectors and other design improvements, researchers say they can achieve that goal. When that happens, businesses in regions where electricity is most expensive could pay for implementing the technology in three to five years with savings in electricity bills alone, according to Earl.
In addition to the environmental and financial incentives – which include a 30 percent tax credit – proponents of hybrid solar lighting note that the higher quality of natural light leads to increased productivity and improved sales in retail outlets. They also note that hybrid solar lighting avoids the environmental problems associated with generating and transmitting electricity.

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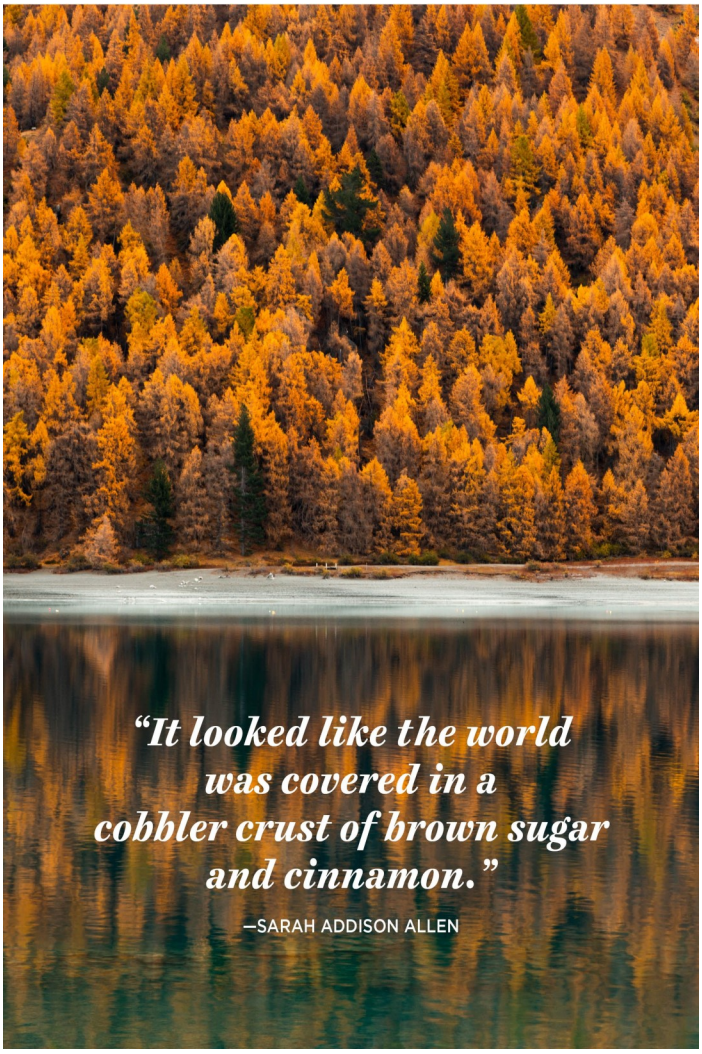


KenKen Puzzle

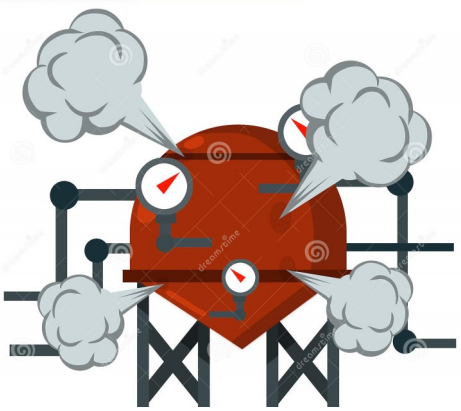
How to solve the Kenken puzzle:

(Answers on page 27)

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

2÷		4	3–	1–	
8+		5–		20×	
3+			3	3–	10×
	600×				
1–		6+	5–		3
	2			10+	

POTENTIAL HAZARD - HOT WATER BOILERS AND HOT WATER TANKS



Both hot water heating boilers and hot water tanks are capable of exploding. During normal operation both are essentially full of water and contain no steam. However, when control and safety devices fail to work effectively, temperature and pressure will increase and may eventually rupture the weakest part of the vessel. As the vessel ruptures, the water violently turns to steam. As an example, a 30 gallon (136L) fired hot water tank which is average for a small business or household, usually operates at 40 psig (276Kpa) and is designed with a bursting pressure of approximately 250 psi (1724Kpa) at 406°F (208°C). When the vessel reaches the bursting pressure, it would theoretically have enough energy to hurl a 1000lb (454kg) projectile several miles. Please test the Safety relief valve on your hot water tank regularly, just lift the lever briefly allowing the water to flow release the quickly to reset the valve.

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Hazmat Management: Tools of the Trade

by Jeffrey C. Camplin

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

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

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

Inventory chemicals

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

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

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

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

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

Managers can expand the inventory to evaluate such components as safety showers, eyewash stations, fire extinguishers, fire blankets, chemical-resistant gloves, chemical-resistant aprons and suits, goggles and face shields, respirators, first-aid materials, spill-management materials — such as

absorbents and specialty spill kits — containers, labeling, shelving, and storage facilities.

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

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

Containers and labels

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

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

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

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

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

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

Storage considerations

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

- Corrosive acids with pH less than 2.5, including hydrochloric and phosphoric acid, which are found in toilet cleaners, battery acid, sulfuric acid in drain cleaners, nitric acid for etching, and acetic acid for photography stop baths. Storage cabinets for these materials should be labeled “Acid.”
- Corrosive bases with pH greater than 12.5, including ammonia, sodium hydroxide, found in oven cleaners, some automatic dishwashing products, and photography developer. These cabinets should be labeled “Corrosive.”
- Oxidizers, including bleach, pool chemicals, concentrated nitric acid, concentrated sulfuric acid, chlorates, nitrates, nitrites, perchlorates, peroxides, sodium hypochlorite, and ammonium persulfate, found in photography reducing solutions. Cabinets with these materials should be labeled “Oxidizer.”
- Flammable materials, including non-chlorinated solvents and solvent-based products; alcohol- and solvent-based cleaning products; butoxyethanol, found in all-purpose cleaners, carpet spotters and glass cleaners; carburetor cleaners; disinfectants; and paints and glazes with heavy metals. Cabinets should be

labeled “Flammable.”

Oil and solvent-soaked rags, which can self-ignite and should not be mixed with other wastes or combustible materials. Special containers for these rags can prevent fires.

Shelving solutions

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

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

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

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

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

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

Emergency response plans

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

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

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ENERGY SAVINGS FOR BUSINESS

MAKE YOUR BUILDING MORE COST COMPETITIVE

Emissions Reduction Alberta's (ERA) Energy Savings for Business (ESB) program will help eligible buildings in Alberta decrease operating costs and reduce emissions.

The program offers incentives to install commercially available high-efficiency products and onsite energy generation technologies that meet their needs.

- Incentives of up to $250,000 are available per project
- Up to $1 million per parent company
- Minimum project incentive amount of $500
- Funding will be awarded on a first-come, first-served basis
- This is a short-term economic stimulus program.

Recognizing that time is money to Alberta's buildings, the ESB program will give buildings fast access to cost-effective incentives. The ready-made menu of incentives will save buildings time and money in developing their projects. A detailed listing and incentives amounts can be found on eralberta.ca/esb.

Project example: Building Envelope

Windows, air leakage, and ventilation make up 75 per cent of energy loss in multi-unit residential buildings. If you are renovating an older condo building, consider upgrading the building envelope and windows. Eligible measures in this category include air curtains and door dock seals (which reduce heating and cooling costs), wall and ceiling insulation, and high efficiency windows.

PRODUCTS ELIGIBLE FOR INCENTIVES

A wide range of cost-effective, high-efficiency products and onsite energy generation technology are eligible for incentives through the program.

Measures most relevant to buildings include:

- Heating, ventilation and air conditioning
- Water heating
- Lighting systems
- Combined heat and power (CHP)
- Building envelope and windows.

Consider this:

Space and water heating account for 80 per cent of energy costs in multi-unit residential buildings. By installing heat recovery ventilation systems, you can reduce energy use by 13 per cent. With high-efficiency condensing boilers (93 per cent efficient), you can reduce energy use by up to 21 per cent. By setting the thermostat 5 degrees lower, you can achieve 9 per cent savings in space heating.

Source: Canada Mortgage and Housing Corporation

BUSINESSES ELIGIBLE TO PARTICIPATE

The program is designed to support the more than 160,000 small- and medium-sized enterprises in Alberta. All businesses and non-profits serviced by an Alberta electric utility are eligible, except for residences; some types of new construction projects; municipally, federally, and provincially owned buildings; publicly funded institutions; and large emitters—as defined under Alberta's Technology Innovation and Emissions Reduction (TIER) regulation.

The common areas and equipment of multi-unit residential buildings, including condo buildings, are eligible. Examples of common areas include, but are not limited to, parking lots, building walls, windows, and the roof. It is important to note that condo units must share a common wall to be considered a multi-unit residential building.

For projects to be eligible, they must occur at facilities or buildings located within Alberta, meet project timeline requirements, and follow the criteria outlined in the Participant Terms and Conditions located on eralberta.ca/esb.

EMISSIONS REDUCTION ALBERTA

APPLICATION PROCESS

1 REGISTER

- **Review available resources on eralberta.ca/esb**
- **Participants and contractors register in program portal**
  - ERA will review and provide approval for eligible contractors

2 APPLY FOR PRE-APPROVAL

- **Participants initiate application**
  - Provide basic project information
  - Assign an eligible contractor
- **Contractors complete application**
  - Provide project details and documentation
- **Participants submit pre-approval**
  - Review, confirm accuracy and submit pre-approval application

ERA PROVIDES PRE-APPROVAL NOTICE

- **Participants accept terms**
  - Review application summary, pre-approval notice and accept Participant Terms & Conditions

3 PROJECT INSTALLATION

- **Participants and contractors initiate and complete project installation**
  - Purchase and install all associated equipment

4 POST-PROJECT SUBMISSION

- **Participants initiate post-project submission**
  - Notifies ERA project is complete and begins review process
- **Contractors complete post-project application**
  - Submit all required documentation
- **Participants submit post-project application**
  - Review, confirm accuracy and submit post-project application

ERA PROVIDES FINAL APPROVAL NOTICE

5 RECEIVE INCENTIVE

- **Participants provide banking information**
  - Provide participant information or assign incentives to contractor

INCENTIVE PAYMENT ISSUED

Image: Condo Building in Calgary

HOW TO APPLY FOR INCENTIVES

Apply now with ESB's streamlined intake and fully virtual approach. Please review all available resources to learn more about requirements, how to apply, and more.

WHERE TO GO FOR QUESTIONS OR SUPPORT

Our website has program information, including program requirements, training videos, application checklists, and more.

www.eralberta.ca/esb

support@esbprogram.ca | 1-844-407-0025

@ERAlberta_ **Emissions Reduction Alberta (ERA)**

We're happy to help you with any questions about the program or how to apply. Our dedicated contact centre is open Monday to Friday from 9 a.m. to 5 p.m.

How does the ESB program benefit buildings?

ESB will directly support the implementation of effective design systems that reduce energy use and emissions. As a result, some buildings may see decreases in their long-term operating costs.

Other tips for reducing energy use and emissions:

Although not included as eligible measures in ESB, buildings can benefit from replacing incandescent bulbs with LED lighting and by installing weather stripping. Additional opportunities can be identified by completing an energy audit of your building.

EMISSIONS REDUCTION ALBERTA

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Trade Show 2022 Highlights

Thank you to all for participating and make the 2022 Tradeshow a success!


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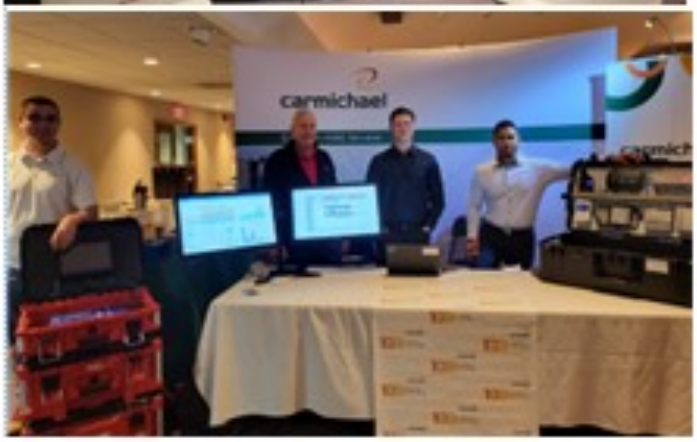
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We look forward to seeing you at the next Trade Show!

Balancing IAQ and Green

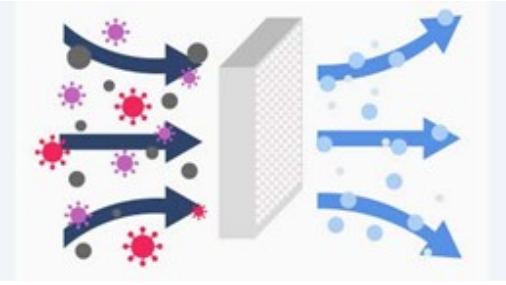
by James Piper

Attention to maintenance, operations and design can result in buildings that are healthy for occupants and friendly to the environment

Email the MS editors. While much has been written about green buildings, widespread confusion exists as to just what constitutes a green building. What does such a building look like? How is it different from a conventional building? What does it take to make a building green?

A green building is one in which indoor and outdoor environmental factors have been considered and protected over the life cycle of a building. These factors include the sustainability of the site, water-use efficiency, energy, materials and resources required for construction, and the indoor environmental quality.

Managers who have succeeded in achieving both goals have done so through a process of focusing on issues such as ventilation, operations and maintenance. Ignoring these issues can result in a building being neither green nor energy efficient.



Design also plays a central role in achieving both goals. For more information, see the accompanying article on this page.

Ventilation

If a building is to meet the needs of the occupants while remaining green, systems must be carefully designed to meet the needs of building occupants and visitors. One indoor air quality (IAQ) issue involves supplying sufficient outdoor air to occupied spaces. A ventilation rate that is too low and a contaminant buildup can make working conditions unhealthy. A ventilation rate that is too high wastes energy.

Providing enough ventilation based on occupancy is particularly difficult in variable-air-volume systems. While these systems typically have a minimum ventilation rate based on code and occupancy, their operation is driven primarily by space temperatures. As a result, the ventilation rate often is too high or too low for the space occupancy.

New building controls can help match ventilation rates to needs. For example, carbon dioxide and occupancy sensors can be specified to set ventilation rates based on actual conditions in the occupied space. Matching ventilation-supply rates to actual requirements curtails energy used to condition outside air, while maintaining proper environmental conditions in the space.

While ventilation rates can help keep IAQ within a desired range, building designs also must look to control the source of pollutants generated within the building. For example, office equipment can generate high levels of a range of pollutants, including ozone. By designing air systems serving these areas so they remove pollutants before they spread, managers can maintain IAQ without relying on high and costly levels of ventilation air.

Most importantly, system designers must not become so focused on one part of a building and lose sight of the big picture. HVAC systems tend to be designed in isolation, so they go ignored unless other systems contribute to the heating or cooling

load.

But few building systems operate in isolation. The way one system performs impacts most other systems. With the advent of interoperable building controls, designers can fully integrate systems. Failing to take full advantage of the interaction between systems and opportunities for interoperability limits the capabilities of installed systems.

Operations

No matter how good the design, buildings will remain green only if technicians operate them properly. Changing ventilation settings to supply more air to one area might solve ventilation requirements for that area, but it robs other areas. Similarly, overriding controls to correct a problem does not really solve the problem, it only masks it. And doing so is likely to create additional problems elsewhere in the building.

Good operating practices for building ventilation

systems are everyone's responsibility. Maintenance technicians must take the time to properly diagnose operating problems to find the proper remedy, rather than simply patching it. And managers must see that technicians have the tools, equipment, supplies and training required to operate the equipment and building systems properly.

Most importantly, managers must make it understood that poor operating practices and quick fixes are unacceptable in maintaining IAQ and the building's green status.

Maintenance

The most important — yet frequently overlooked — element in trying to achieve both green status and healthy IAQ is proper maintenance. Too many buildings operate under the no-maintenance mentality: If something is working, leave it alone.

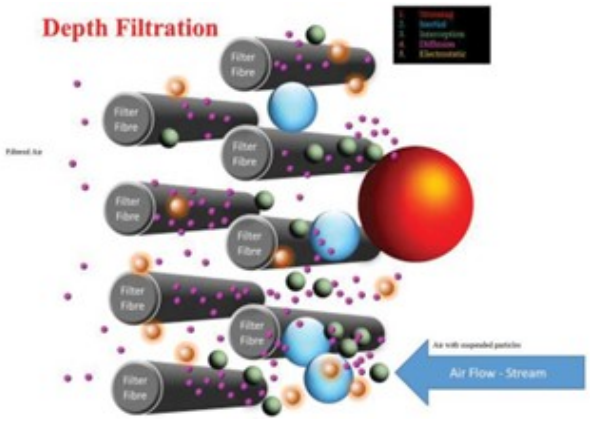
Similarly, system components might need maintenance, and managers might know that components require maintenance, but sufficient funds might not be available to perform the activities. So the maintenance is deferred.

Unfortunately, failure to properly maintain HVAC systems, particularly ventilation systems, will result in increased energy requirements and worsening IAQ. From the day of installation, systems deteriorate.

Ventilation systems go out of balance. Temperature control systems go out of calibration. Components fail. The rate of change generally is so slow that it goes unnoticed to the occupants and, therefore, rarely gets recognized as a maintenance problem.

The best defense against this slow deterioration is an ongoing maintenance testing and monitoring program. Both must be performed on a regular basis if managers expect the systems to continue operating efficiently and without loss of air quality.

A good maintenance program also requires that when problems occur, technicians fix them



properly. It is a strong temptation for maintenance personnel, particularly in understaffed departments, to take shortcuts. Instead of taking the time to fully diagnose a problem, they resort to patches. It isn't long before the patches need patches.

Unfortunately, patches mask problems rather than actually correcting them. And with each patch and quick fix, system performance and IAQ can suffer.

Being green and providing proper IAQ is not difficult. While it requires that managers be willing to change the way they and their departments do business, the payoff in reduced operating costs, improved IAQ, reduced health liability, and increased occupant productivity and retention makes the change worthwhile.

Design that Delivers IAQ

The need for green buildings and good indoor air quality (IAQ) has greatly affected building design. Traditional design has relied largely on the path of least resistance. This path follows the same processes used in the past, with only minor changes. It features similar materials and building systems.

Most of today's systems are tried and true. Designers are confident that their new designs will succeed because it is based on successful designs.

But problems occur in defining success. In the past, success had meant completing the project on budget and on time. Few people defined success as designing a building with low life-cycle costs or one that provides a healthy environment for its occupants.

Today, the situation has changed. Low first costs no longer can be considered the major driving factor in building design. Besides low first costs, a successful building design today must have low life-cycle costs, good environmental properties, and low energy costs. In short, they must be green.

Today's successful designs, particularly those involving HVAC systems, must break with the tradition. For example, it had been common practice to oversize ventilation and distribution systems by up to 15-25 percent to provide spare capacity, oversizing results in lowered energy efficiency, as well as higher operating costs, and installed costs.

No More 'One or the Other'

Not long ago, it was an accepted fact that maintenance and engineering managers had to make a choice — operate an environmentally friendly facility or provide the best possible indoor environment for its occupants. The two choices were considered mutually exclusive.

In this scenario, measures that aimed to reduce energy requirements resulted in poorer indoor air quality (IAQ). And those measures implemented to improve IAQ would increase the building's energy requirements — going green meant higher costs.

Some managers blame many of today's building IAQ problems on energy conservation efforts that followed the energy crisis of the 1970s. High energy costs led to changes in the design and operation of buildings, changes that included tighter construction and lower ventilation rates. The result of these changes came to be called tight -building syndrome.

Today, after more than a decade of experience, managers of green facilities know that they can achieve both goals. Environmentally friendly facilities no longer are necessarily energy hogs, and energy-efficient buildings do not necessarily create working environments that are detrimental to occupants.

James Piper is a national facilities management consultant with more than 25 years of experience.

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The 'call for abstracts' is live for the National Conference on Building and Facility Operations' June 2023 building conference. building owners and operators are being targeted as well as consultants who are involved in making buildings more energy efficient. A list of anticipated topics to have presented at the conference is included and speakers are being sought.

Please click on the link for further information:

https://ncbfo.ca/western/events/ncbfo-2023/

Kenken Puzzle Answer

2÷ 6	3	4 4	3− 5	1− 2	1
8+ 3	1	5− 6	2	20× 5	4
3+ 2	4	1	3 3	3− 6	10× 5
1	600× 6	5	4	3	2
1− 4	5	6+ 2	5− 6	1	3 3
5	2 2	3	1	10+ 4	6

TEST YOUR OPERATOR IQ ANSWERS

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

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JOIN US:
TUESDAY NOVEMBER 8, 2022 AT 5PM FOR OUR IN-PERSON MONTHLY MEETING

Presenters: Brian Malkinson & Adam Fonseca
Custom Power Generation

Title: Generators and CSA 282 Presentation

Summary: Backup power systems in buildings are nothing new, however with the challenges of COVID and changing building use patterns pulling building operators in many different directions there is no time like the present to review this key component of your building and ensure it is maintained and meeting code.

Brian Malkinson and Adam Fonseca from Custom Power Generation will be going over CSA 282, the code which lays out the checks that need be done on life safety backup generators. They will also be giving an overview of the generators themselves, related ATS equipment, their testing and how they might interact with your buildings other systems (such as elevators) during testing.

Bio: Brian and Adam have over 17 years of combined hands-on experience in Power Generation. In addition, Adam Fonseca has a Degree in Mechanical Engineering from University of Calgary, Brian Malkinson has a Degree in Science from Simon Fraser University

We look forward to seeing you in-person for our November meeting at 5pm at the Danish Canadian Club (727 11 Ave SW) on

Tuesday November 8, 2022.

Just for laughs!

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