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BOA

Building Operators Association of Canada

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What's Inside?

Executive & Committees

President Les Anderson	president@boacalgary.com C: 403 921 0648
Vice President Mark Arton	chairman@boacalgary.com (c) 403-305-7029
Associate VP Vacant	associate.vice.president@boacalgary.com
Chairman Mark Arton	chairman@boacalgary.com (c) 403-305-7029
Treasurer Carrissa Speager	treasurer@boacalgary.com (c) 403-969-0329
Secretary Monika Bhandari	secretary@boacalgary.com (c) 403-470-4169
Education Committee Vacant	education@boacalgary.com
Membership Committee VACANT	membership@boacalgary.com
Promotions Committee VACANT	promotions@boacalgary.com
Activities Committee Samson Isowode	403-874-0850
Technical Concerns Kyle D'Agostino	chairman@boacalgary.com
Webmaster Les Anderson	webmaster@boacalgary.com

Important Phone Numbers

Emergency	911
Alberta Boiler Association	403 291 7070
Alberta Labour (Emergency)	403 297 2222
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City Of Calgary (All Departments)	311
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President's Message

BOA Building Operators Association of Canada

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

I wonder, what we can do to get young people to want to choose roles in Building Operations. The average age of a Building Operator has improved some-what over the last few years from 53 to 49 but it still is too high. We need to attract new young people into our roles. It seems to me that there are training programs in public schools that students take that can prepare them for entry into the work force. Programs such as Carpentry, Auto Mechanics, Electrical for both Construction as well as Technical. It exposes and prepares students that would want to enter the workforce under the trade's programs and gives them an idea of what the job would be like. I would like to say that there could be a selection for students to take the 5th class course in school and with some exposure to the variety of aspects of careers in Property Management. From Technical Operations to Building Sciences as well Property Administration.

The advantages to a Red Seal program are the salaries are set, based on percentages of the Journeyperson. The time spent as an apprentice is a paid education through all the years. Now even the time spent in school is paid. That the wages are set, and the career path can be followed with the trades is why in schools it can be promoted. In Building Operations, we need to do the same. But before the career can be acknowledged by the school system certain conditions must be met. The career path must be established for the students to be able to follow. There needs to be a salary attached to each stage. The salaries should have a band and each role needs the salary band next to it. I have seen on the Hays report on salaries, and we could use that as a basis to present to the educational system to have the course entered in the school system.

The role of the Building Operator is much the same as the journeyperson program, only to become certified, is much quicker than the 4-year Red Seal program. The 5th or the 4th class certificate of competency are stand alone certificates and don't require the person to have to go further. Not to have to apprentice for four years. To take and pass an approved course and apply 6 months experience as a Heating Plant Operator will place that person in a building, as an entry level Building Operator, Class 5. The wages of an experienced Building Operator are sufficient to earn a living. The opportunity to expand the role from entry level is varied and could satisfy all types of persons. We just need for young people to investigate the roles in Real Property Management and let them see the wonderful and diverse life that is in Building Operations.

We look forward to seeing you at the December meeting at the Canadian Danish Club on December 12.

Smiles))

With kind regards,

Les Anderson PE, RPA

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 26*

1. Sludge is usually removed from the boiler with:

a) filtering the water before it leaves the boiler

b) raking it into a sludge trap

c) vacuuming it from the bottom

d) blowing down through the bottom blow down connection

e) blowing down through the continuous blow down

2. Sodium phosphates:

a) will put a light protective scale on the heating surfaces

b) will prevent scale formation and keep the boiler water alkaline and non-corrosive

c) absorb dissolved oxygen and prevent CO_2 pitting

d) prevents the formation of any kind of sludge

e) prevents erosion of the boiler metal

3. Sodium sulfite chemical will:

a) prevent corrosion due to oxygen in the boiler water

b) precipitate with calcium and magnesium

c) prevent scale adhering to the tubes

d) control foaming

e) control return line corrosion

4. Sodium sulfite is used in boilers to:

a) prevent scale formation

b) prevent carryover

c) control dissolved solids

d) reduce oxygen corrosion

e) prevent foaming

5. The boiler blow-off should be used to:

a) reduce steam pressure

b) reduce feedwater pressure

c) control the total dissolved solids

d) prevent scale formation

e) expel the sodium sulfite

Reroofing: What Do You Get for Your Money?

by Karen Warseck

One memorable commercial on television was an automobile mechanic who used the line, “pay me now or pay me later.” Does the same principle hold when it comes to reroofing a building? Does spending more now mean a longer lasting roof later? The answer is maybe yes and maybe no. There are no guarantees that spending more now will translate into spending less later. However, there is a very good chance that it will.

Why shouldn’t spending more produce a better-quality roof? Wouldn’t spending more mean better materials, better design, better installation, better warranties? The answer is not necessarily.
With materials, cost is usually analogous to the quality of the roofing product, especially within the range of products offered by the same manufacturer. Roofing products manufacturers usually produce several grades of their own products, and there are definite cost differentials between commodity roofing products and products used when a roof is designed and specified for a particular situation.

The commodity products tend to be cheaper materials. The reason is that when no specifications are produced prior to bidding, and the contractor is asked for a price without guidance as to what to bid on, the contractor will tend to prepare its bid using the lowest-cost materials, the commodity roofs. This is understandable — roofing contractors do not make any money if they are not installing roofing. When price is the overriding criterion, cheap is better and more likely to win the job for the contractor. But cheap usually means thinner, less durable materials. If there is no upfront guidance on what should be installed, materials are chosen strictly by price.

Within each category of roofing products, thicker usually means better. Why? With flexible sheet membranes (a.k.a. single plies), the more material embedding the reinforcing scrim, the longer it takes the surface of the material to erode down to the scrim. This means it takes more time for the membrane to wear out.

In addition, thicker sheets can be fabricated with heavier reinforcing scrims for additional puncture resistance, which helps to prevent damage from foot traffic, dropped tools, etc. Cheaper flexible sheet membranes also tend to use more filler in their formulations than more expensive membranes. One way to keep the cost of the materials down is to use less of the expensive chemicals that improve pliability, UV resistance or fire resistance. All of these factors can reduce the life of the material on the roof. With built-up membranes, “thicker is better” refers to the number of plies and not necessarily the measured thickness of the finished roof. It is possible for a built-up membrane to contain too much page 12 asphalt between the plies of reinforcing, in which case a thicker roof is actually not better. Generally, however, a thicker built-up roof means that there are more plies and more layers of waterproofing bitumen, so that it takes longer for the roof to wear out.

Modified bitumen membranes, often installed as cap sheets on built-up roofing plies, are generally longer lasting when thicker and when they contain more plies. More plies and thicker mats cost more. Exotic asphalt modifiers that change the physical properties

of the asphalt cost more to produce but may extend the life of the roofing system because of these altered properties.

Boosting Returns With Insulation

One upgrade on a roofing system that generally has an immediate benefit is insulation. The cost of thicker insulation is generally not a great deal more than thinner layers. Higher R-values are not much more expensive than lower R-values. Insulation, especially where the roof area is extensive, can reduce heating and cooling bills enough to pay back the cost of the insulation in a few heating and cooling seasons.

Sheet metal accessories are another material used on the roof where a small increment in the cost may result in a much longer-lasting product. If a few extra cents per square foot are spent to upgrade from galvanized steel to stainless steel or aluminum, the metal will not corrode as fast and will last longer. A thicker metal sheet can also add durability. However, upgrading to a heavier gauge of metal may increase the cost without benefit, since the extra cost may be due to the increased difficulty of bending and handling the metal.

As a general rule, an upgrade in the materials usually means an upgrade in the quality of the roof system. This upgrade generally comes for only a modest additional cost. The cost of labor generally does not increase when the product is upgraded, nor do upfront costs incurred by the contractor for moving materials and equipment to the site, pulling permits, overhead or profit. Only the cost of the materials is different. To see what benefit a better quality and more expensive material will bring, consider the warranties offered by the manufacturers — a 10-year life vs. 15, for example.

So when isn't the more expensive material a wise choice? If the investment goal of the owner is to sell the building in five years, it makes no economic sense to put on a premium roof material with a premium cost.

Another reason is that some roofing manufacturers inflate the price of materials and give the customer "free" consulting services. Although in some instances the materials are superior, in many cases the materials are the same as other manufacturers' products; they may be just a private label of another manufacturer's product.

Design Considerations

Does commissioning an architect or engineer to prepare construction documents mean a better roofing project? Does paying higher fees mean a better set of documents, better bidding assistance, better construction administration and, by extension, a better roofing project? Generally, yes.

Consider construction documents. A good set of construction documents should address the myriad constraints of existing conditions, codes, insurance requirements and budget; the issues of availability of materials and manpower to install the job; the choices of materials; and such other issues as attachment methods, seaming methods, surfacing, chemical compatibility and vapor retarders. Then the details have to be devised to be sure the penetrations will receive proper treatment. These and other items that will affect the work should be anticipated and dealt with before construction has started. All this takes time, and the cost is greater when more time is spent.

Relying on the contractor for all this may be penny-wise and pound-foolish. Even when a contractor knows what is best for a roof, that may not be what the contractor bids. If a facility executive is just calling in contractors to give prices without providing clear bidding documents, roofers know that the facility executive is not really looking for the best

solution, but rather the cheapest price. That is what they will deliver — maybe not all the bidders, but at least one. And when low price is the goal, the low bid will win. If quality is the objective, the facility executive should consider spending the extra money — from 5 to 10 percent, depending on the number and type of services rendered — to have a professional involved in the preparing of construction documents, bidding the work, administering the contract and observing the installation.

When doesn't design pay for itself? The answer is when the extra investment doesn't produce better documents, bidding assistance and so forth. In many jurisdictions, there are no licensing requirements for roof consultants. Another potential problem is that the architect or engineer may not have a good understanding of what a reroofing project involves. That can be true even if they have designed hundreds of roofs on new construction. The result can be inferior work.

Another potential pitfall is bidding professional services. That approach will not save money unless the services being bid are exactly equal in scope, the services are sufficient to provide enough information to the contractors, and providers have the requisite knowledge to do the work. What one consultant is bidding may be a sketchy outline of the roofing work to be performed while another one may be proposing to provide a full set of construction documents complete with details, roof plans and specifications. Though both can be considered "specs," they are clearly not the same thing.

Better Installation

Finally, there is the question of installation. Everyone wants the contractor to charge as little as possible. Is it worth the money to spend extra to get a good contractor? If indeed the result of spending more is getting a better quality contractor, the answer is emphatically yes. But there is a very large caveat. Higher cost may just mean higher profit margins, not better quality. A roof consultant may know who the better contractors are and whether their higher bids are worth the extra money.

Good contractors do have costs that other contractors will not, including training, insurance and workers compensation, salaries to keep superior mechanics in an employee-driven job market, and equipment. All these things add up, but without them, the contractor cannot provide superior work.

In addition, it takes time to do the details that make the difference between long roof life and a short-term disaster. For example, smearing roofing cement on a penetration will seal it temporarily, but taking the time to install a proper flashing will seal it for as long as the rest of the roof lasts. It increases the contractor's production time to do the work right, which means it costs more in the contractor's proposal.

When there are no construction documents from which the contractor will bid the work, the lowest-cost proposal will contain the cheapest methods of sealing penetrations, such as pitch pans rather than metal flashings or lapped joints in gravel tops rather than cover plates at seams. Such small items will cost less but will lead to maintenance headaches and extra cost in the future.

So when is it better to pay a contractor less? When all of the prequalified contractors are bidding the same

scope of work with the same materials and methods, the best price really is the best price.

The old saying that you only get what you pay for is true in roofing. Quality costs more in the beginning — quality materials, good design and good installation are key. Quality takes time and costs a little bit more, but the small increment in upfront price is usually worth paying. The savings occur in the long term — when the roof does not have to be replaced as quickly, when tenants are happier with a dry building and when the facility executive can go home at night without worrying about that 3 a.m. call, "The roof is leaking — again."

Karen L. Warseck, AIA, is president of Building Diagnostics Associates, a Hollywood, Fla., architecture firm that specializes in building repair consulting. She is a long time contributing editor to Building Operating Management on roofing and exterior wall issues.

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PLAYING IT SAFE

by Alan S. Bigger & Linda Bigger

Emphasizing on-the-job safety benefits workers, departments and bottom lines.

Private industry reported 6. 1 million workplace injuries and illnesses in 1997, according to survey data from the U.S. Department of labor's Bureau of labor Statistics. About 5.7 million of those injuries

kept injured workers off the job for a period of time.

Lost time and productivity translate into lower production, higher overhead and lower profits, so managers who provide services in a facility should strive for zero tolerance of work-related injuries. Such a program can save the company significant dollars while increasing employee morale and well-being.

Many tasks put custodians and customers at risk of injury. From a simple but essential task such as mopping a floor to trash removal, vacuuming or operating large pieces of floor equipment such as an auto-scrubber or an auto-burnisher, the potential for injury is ever present.

On-the-job hazards. By identifying potential hazards, developing safety measures and using safety checks, managers can minimize the potential for injuries. Among the hazards custodians may be exposed to daily are these:

Slips

This hazard is always present while mopping or stripping floors and can cause sprained ankles, torn ligaments or knee injuries.

Falls

Many custodians climb ladders to change light bulbs or clean walls and ceilings. Once in an elevated position, the risk of falling increases.

Cuts and sticks

Even the contents of a simple desk-side trash container can expose a custodian who empties the container to cuts from broken glass or sticks from sharp objects such as needles.

Back injury

Each day, custodians must lift, move and handle items and operate heavy equipment. Each task presents the opportunity for back injuries, ranging from simple muscle strains to herniated discs.

Electrocution

Custodians use many pieces of electrically powered equipment such as vacuums and floor machines. Wherever electricity is present, the possibility of electrocution exists. Such injuries can be caused by frayed wires, improperly grounded equipment or equipment that has some electrical malfunction. Anytime water is present, workers should take extreme caution when using electric powered floor equipment if water is present because water can cause equipment to short out.

Burns

Custodians using water for cleaning tasks may be

exposed to hot water, either at the source or from equipment, such as steam cleaners or hot-water extractors. Workers that use propane buffers may be burned by hot exhausts or un-insulated components.

Repetitive motion injuries.
These types of injuries — which include carpal tunnel syndrome — result from the consistent motion of parts of the body, such as wrists and hands, when performing such tasks as mopping or vacuuming floors.

The incidence of injuries often is linked to the equipment cleaning crews use. For instance, the chance for injury for a worker who is dust mopping, damp mopping and vacuuming may be less than that for a cleaner using dry/wet vacuum pick-up units, carpet extraction units, autoscrubbers, buffers, burnishers or other types of equipment.

Safety Measures
What safety measures should a manager implement to minimize the risk of injury in the department?

Managers should stress safety as a way of operation. For example, organizations should offer a companywide safety training program. Reactive safety programs are a failure because someone has already been injured. Such actions are a bit like closing the barn door after the horse has escaped.
Also, refresher courses should be provided, and safety posters and related safety information should be placed at strategic locations throughout the facility. Managers also should consider these tactics:

✦ Encourage people to think safety, act safely and be safe. The corporate culture should encourage safety at all levels. Wearing gloves to perform a certain task may seem minor, but a pair of gloves may prevent bums, cuts and chemical reactions on the skin.

✦ Train workers on the correct operation of equipment they use to perform tasks. Encourage vendor participation in the safety process, provide operator manuals, and train workers on each piece of equipment from start-up to shut-down. For workers moving heavy items, managers should provide appropriate equipment, such as hand carts, flatbed carts and stair movers.

✦ Check each piece of equipment before use to ensure it is in proper operating order. For instance, checking connections and hoses on a high-pressure washer may prevent serious injury. Damaged hoses or loose connections can leak water under high pressure, possibly causing burns or skin lacerations. One method to encourage this type of safety is to require an operator to complete a safety checklist for each piece of powered equipment before using it.
✦ Set up a safety inspection program that monitors how people use, clean and service equipment. Managers can institute the use of a checklist to ensure that workers comply with safety directives.

Buy ergonomically correct equipment. Talk with custodial equipment providers and specifl equipment that has documented ergonomic advantages. Buy powered equipment that minimizes pulling or pushing. If direct electrical powered equipment of 110-208 volts is a concern, consider battery-operated units that eliminate exposure to high- voltage equipment.

In other words, buy the right piece of equipment with the best safety features to perform the task at hand by matching the work to be performed to the characteristics of the equipment to be purchased.

Enforcing safety
Once an active safety program is in place, managers should take steps to ensure that the exposure to injury from powered or non-powered equipment is minimized. Have all electric-powered equipment checked by a qualified electrician regularly to ensure the electrical system operates correctly.

Document these checks.

✦ Check daily to ensure that the grounding pins of units that are required to be grounded are in place. While doing this check the electrical wall outlets to ensure that the grounding pins are not broken off in the wall outlets. Floor equipment such as wet vacuums and auto-scrubbers that use water as part of their operation must be grounded correctly and connected to a properly grounded wall outlet.

✦ Check electrical cords for cuts, kinks or knots. If these conditions are present, replace the cord.

✦ Check that batteries used in battery-powered equipment are working and that battery chargers are working correctly. Batteries should be maintained according to manufacturer directions, and appropriate ventilation should be provided so gases generated from the charging process do not build up.

Managers should require personnel to wear appropriate safety equipment, and equipment use instructions should be explained in the department's personal protective equipment manual or policy. Some automated floor equipment uses chemicals, so operators should be required to wear goggles and gloves at a minimum when using chemicals.

Workers should be required to follow the directions of material safety data sheets carefully, and they should wear protective footwear with non-slip soles if operating equipment.

The finer points:

Monitoring

Managers should monitor cleaning personnel to make sure they use equipment for its designed purpose. For example, cleaners have been observed using a standard upright vacuum to pick up wet dirt and debris. Picking up dirt that is wet exposes the operator to electrical shock.

Maintenance

Implement an equipment PM program that starts with a requirement that machine operators clean the equipment after each use. They should wash and rinse the equipment, check filters, and check power cords and connections, as well as document any service checks.

Developing a program that emphasizes zero tolerance for injuries is generally a matter of basics. In most cases, occupational injuries are due to operator error, so by increasing awareness of the need for safety, housekeeping managers can reinforce that each worker is a valued member of the team.

A zero tolerance program can benefit housekeeping workers and departments, as well as add zeros to the organization's bottom line.

Demonstrating Safety

Housekeeping managers updating or implementing a worker safety program should consider using a performance-based approach. In other words, a worker trained in how to use a buffer should be able to demonstrate in action how to use the equipment correctly and safely.

For example, custodians should be trained in the safe operation of a buffer, including include such tasks as installing pad drivers, changing buffing pads and levering a buffer to make it move in one direction or the other. Once the initial training is completed, the custodians should each demonstrate the correct procedures by actually running the buffer by themselves.

In another example, custodians who handle such tasks as moving floor cleaning equipment or removing large quantities of trash from buildings should be trained in safe lifting techniques, and they should be required to demonstrate these techniques. They also should be provided with personal protective equipment, such as back supports, to further prevent injury.

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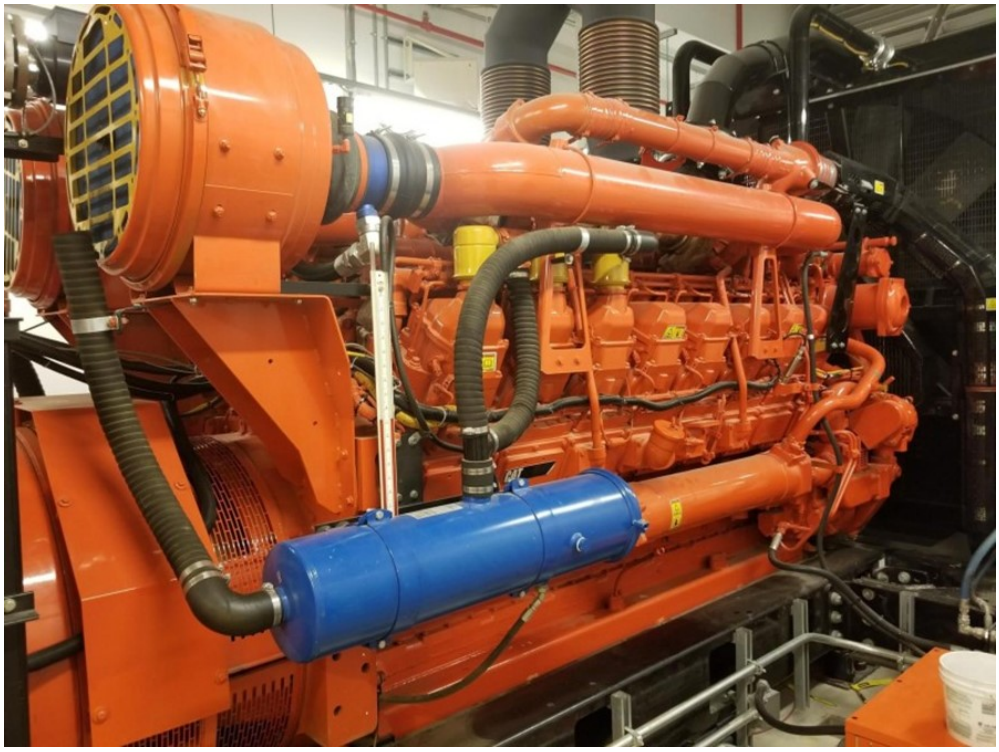
Facility Manager's Guide to Life Safety Emergency Power Standards - Part II

Bill Henderson



Are you responsible for the safety and reliability of emergency power systems in your facility? Ensuring the uninterrupted operation of critical systems during power outages is an important duty. In the world of facility management, staying ahead of potential emergencies is not just a responsibility; it's a mandate.

Continuing on from Part 1 in our series, part of this responsibility involves conducting meticulous monthly checks on your emergency power systems. These checks are more than just routine maintenance; they are the lifeline that safeguards your facility during unforeseen power disruptions. They encompass a comprehensive series of tasks, each serving a crucial purpose in guaranteeing the resilience of your backup power infrastructure.

Once again, it is important to stress that while the Weekly Visual Generator Inspection can be completed by relatively inexperienced staff, enlisting the experience of your generator service provider to conduct on site generator tutorials would be extremely helpful as every setup of equipment is different. No amount of explanation of a system can surpass an in person walk through where questions are asked and answered.

As the saying goes:
Tell me and I may forget,

Show me and I may remember,
Involve me and I will understand.

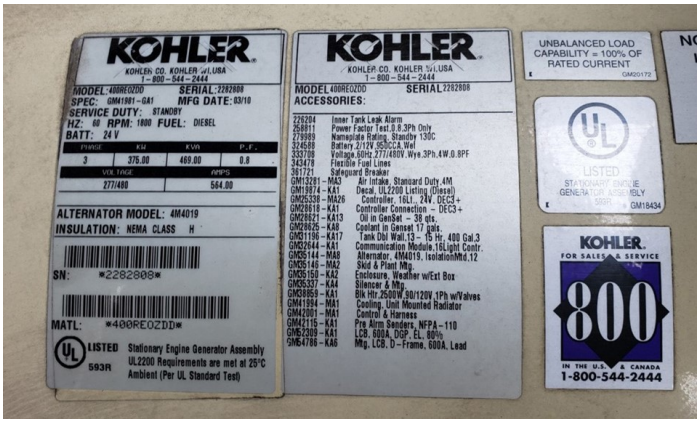
Complete the following monthly generator system checks:

1. Complete all items specified in weekly testing requirements in Part I
2. Test and verify the entire system as follows:

a) Simulate a utility power failure so that you can be sure your backup generator will start by tripping (opening) the breaker that feeds the automatic transfer switch (ATS). The power will be out for about 10 seconds while the generator fires up, stabilizes and the ATS initiates the transfer of power from utility lines to the backup generator.
Good example of a monthly standby generator test for a water plant in a Northern community.

b) Ensure that the battery charger current output increases while cranking. Many automatic chargers will have voltage and current gauges. If not, you can use a battery load tester such as this one or use a multimeter. To pass a load test, the battery must maintain 9.6 volts at 15 seconds when tested at one-half the CCA rating and 70°F (or above). **SAFETY NOTE:** While relatively rare, crank batteries do occasionally blow up when a sudden draw of amperes is made turning the engine over. If you have your face anywhere near the crank batteries, make sure you are wearing a face shield and have an eyewash bottle with you. Baking soda is required to neutralize battery acid on your skin and clothes. Make sure these items are part of your maintenance kit.

c) Operate the gen-set under at least 40% of the rated load for one hour. For example, if your generator plate has a rating of 375kW, you must have a building load of 150kW to test the generator every month for one hour to comply with the CSA282. If building load cannot supply the 40% required to meet the standard, external resistance load banks will be required.



Typical Kohler gen-set plate denoting 375kW at 480v.

d) CSA282-19 and Health Care Joint Commission standard EC. 02.05. 07 EP7, require that all automatic transfer switches be tested monthly under load.

ASCO transfer switch control panel.

e) Inspect brush operation for sparking, if applicable. An alternator converts mechanical energy into electrical energy by spinning a magnetic field using a rotor to create energy. A brushed alternator uses carbon brushes to help conduct electricity, while a brushless alternator uses two sets of rotors that spin together to generate and transfer the electrical current. Brushes sparking can be caused by a number of factors: light loads, excessive brush wear, damaged or dirty commutator or incorrectly installed of incompatible brush.

f) Inspect for bearing seal leakage on the alternator. Grease leaking from a sealed bearing is usually caused by a ball or cage shift, centrifugal force or grease flow due to high temperature. Applying too much grease during maintenance can result in a seal failure if there is not relieve port. It is best to use an infrared thermometer to check the temperature of the bearing while running as friction will result in a high temperature if the bearing is failing.

g) Have your generator service provider walk around your installation with you to point out all auxiliary equipment that needs to be inspected. Inspect for correct operation of radiator shutter or damper controls, coolant pumps, fuel transfer pumps, oil coolers, and engine room ventilation system (s).

h) Record the readings for all inspected equipment in the log and verify that they are within expected norms.

i) Drain the exhaust system condensate trap to prevent the metal from rusting. Particularly important in colder climates as water in the trap can freeze and block the exhaust, preventing the engine from starting automatically when needed.

3. Inspect block heater hoses and wires for firm connections, absence of leaking and corrosion. Using the back of your hand, feel the block heater hoses for warmth. Most block heaters are set to engage below 80F and disengage at 120F, depending on the block heater thermostat installed. If the thermostat fails, the block heater can be cold or continually cook the coolant to a higher temperature, which will be apparent as you bring the back of your hand closer to the heater.

Ironically, one of the most common block heater failures has nothing to do with the equipment itself but to staff using the 120v receptable for other equipment and neglecting to plug the heater back in or tripping the breaker that feeds the receptable powering the heater, resulting in a cold crank failure in winter months.

4. Batteries and charging equipment:
Inspect all battery cells for correct electrolyte fill level (applicable to vented or flooded lead-acid batteries only). As a safer alternative, perform a battery conductance test using a conductance tester. Battery conductance is measured by evaluating the voltage response to a small, select frequency AC current signal briefly impressed on the battery. The resultant conductance measurement provides pertinent battery information without the need of bringing the battery to full discharge.

What is the difference between a load tester and a conductance tester?
A conductance test can also be repeated multiple times on the same battery without draining the battery, unlike a traditional load test, which pulls out a lot of amps. That also saves time because there's no need to recharge the battery before or after testing.

Record test results in the logbook for trending purposes.
b) Test all battery cells for correct electrolyte -specific gravity (applicable to vented or flooded lead-acid batteries only). The electrolyte in a fully charged battery is usually 1.26 times as heavy as an equal volume of pure water when both liquids are at the same temperature. The battery electrolyte would therefore be described as having a “Specific Gravity” of 1.260 meaning that its weight is 1.260 times the weight of pure water. This inspection may be omitted if the conductance test in Item a) is performed.

5. Correct all defects found during inspections and tests. Tightening connections, cleaning corroded connections and so on.

6. Record all inspections, tests, and corrective actions in the log. Any activity on the generator or in the generator room by internal staff or outside contractors, should be recorded in the log. This is often the first stop of fire inspectors when evaluating the readiness of the emergency standby generating system.

7. Inspect all electrical components to ensure proper function, such as generator room lighting and heating independent of utility power.

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KenKen Puzzle

How to solve the Kenken puzzle:

(Answers on page 26)

- 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

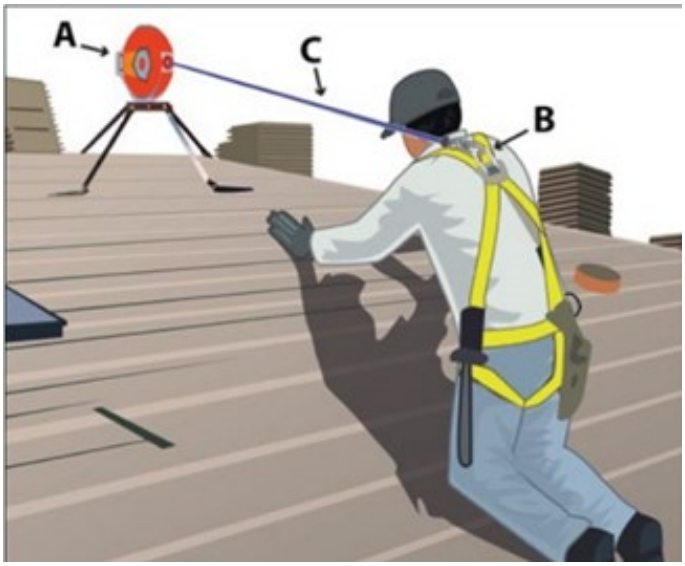
9	8			4		5	3	
					8	2		7
2	5		3		6		4	8
5	6		1					4
7	2		9	8			1	3
				6	7	9		
4			8	3				2
		2				4		
	1	6	2		4	3		9

The Road To Safety

by Jeffrey C. Camplin

Safe workplaces don't just happen. Reaching that goal requires managers to plan, act and follow up.

The work of maintenance and engineering departments is fraught with potential dangers. From inspecting boilers and troubleshooting power distribution systems to inspecting roofs and using power tools, workers face safety hazards daily.



An effective employee safety and health program is a decisive factor in reducing work-related injuries and illnesses. For a safety program to be effective, it must address all workplace-related hazards.

Regulations govern many hazards employers must identify. But whether regulations govern hazards or not, maintenance and engineering managers and their staffs must identify and address existing and potential hazards, including those occurring from changes in workplace conditions and practices. Departments must identify and control job-site hazards for a safety and health program to succeed.
Effective safety and health programs — those that keep employee injury rates exceptionally low — typically have common characteristics. These characteristics include organized and systematic methods for assigning appropriate responsibilities to all managers, supervisors and employees, such as continually identifying, inspecting and controlling existing and potential workplace hazards.

The benefits of controlling workplace hazards, however, go far beyond lowering worker injury rates. They also include improved worker morale, higher productivity rates, and an improved bottom line for the organization due to reduced worker compensation rates, as well as other direct and indirect costs.

An engineering and maintenance staff's duties have a great deal of influence on the success of workplace safety programs because their daily duties are among the most hazardous activities that take place in facilities.

Setting goals and direction
Everyone is responsible for safety, but effective safety programs require recognition and support from top management. Maintenance managers should not despair if upper management at a

facility offers little or no support. With a little research and salesmanship, managers can easily translate the benefits of safety to top management into dollars and cents.

The commitment of top management, along with employee participation, provides the synergy necessary for an effective program. Top management not only provides needed resources but also is a motivating force for organizing and controlling program effectiveness. Involved and committed top management recognizes employee safety as a core value of the organization.

Employee involvement provides a commitment to safety and health protection for themselves and other workers. Maintenance and engineering duties require that both groups understand the importance of maintaining a commitment to safety.

To make safety a priority, managers will have to develop clearly stated work-site policies on safety and health for engineering and maintenance staffs. Also, a policy statement will communicate the value of safety to the organization.

Managers also should establish goals and objectives for implementation. Since an effective program requires the commitment of employees and managers, all personnel in the organization must participate in its development, planning and operations.

Assigning safety responsibilities also should involve all staff. A clear statement of how these responsibilities relate to organizational goals and objectives is essential because employees won't perform if they don't know what is expected of them.

Maintenance and engineering departments also will need the necessary authority and resources so they can assign responsibilities. With authority comes accountability, however. It is crucial to track performance by the organization and individual departments to reward compliance and correct non-compliance.

Identifying hazards

The form of a safety and health program's elements and implementation actions varies at each organization, based on its size and the nature of hazards and potential hazards the program addresses.

One element that will surely fall in the lap of engineering and maintenance departments is hazard identification, prevention and control related to maintenance tasks. In general, hazard prevention and control are triggered by a determination that a hazard or potential hazard exists in the workplace. But identifying hazards and potential hazards in the workplace requires an active engineering and maintenance staff.

Ongoing examinations of work processes and working conditions must be thorough because many hazards can be difficult to recognize, and recognizing hazards that could result from new or changed work practices or conditions requires special observation and thought.

In fact, identifying existing and foreseeable hazards might require outside expertise, but a systematic and thorough approach involving both managers and workers can uncover most hazards.

One particular area of safety responsibility for maintenance and engineering departments relates to preventive maintenance. Besides helping departments head off potential equipment problems, preventive maintenance is essential in revealing potential hazards and preventing breakdowns that could create safety hazards.

Another essential task for maintenance departments involves analyzing planned and new facilities, processes, materials and equipment for hazards. Departments

should perform these analyses routinely to uncover previously unidentified hazards. The successful involvement of employees in hazard prevention and control requires that they understand the threat a hazard poses and ways they can protect themselves and others.

Personnel who perform comprehensive baseline and specific-hazard audits might require greater expertise than those doing routine inspections. Technicians who perform regular assessments, audits and inspections should have enough experience and competence to recognize hazards and identify the actions to resolve them.

Involving employees in efforts to identify and control hazards gives them valuable insights into the process. In many instances, workers understand specific hazards better than managers and supervisors, and they know the resources that are necessary to correct and control them.

Designing inspections

The assessments, audits and inspections that departments use must fit the goals and objectives of their organizations' safety and health programs, so managers must be thorough when developing and implementing them.

Managers first must know where to look for safety hazards. If reducing worker injuries is a goal, using accident and workers compensation statistics might determine where to focus resources. If regulatory compliance is a goal, findings from a mock inspection by the Occupational Safety and Health Administration or a review of common citations to a particular facility type might provide guidance.

Assessments, audits and inspections can be general, specific or somewhere in between. For instance, periodic inspections could start with a facility-wide or department-wide general approach, and alternating inspections and audits could focus more specifically on operations.

Examples of more focused approaches include evaluations of electrical, fire safety or machine guarding in specific areas, such as offices, production areas, warehouses or maintenance shops. Reviewing recent injuries, accidents or near-miss instances will identify hot spots that might require more focused attention.

Other considerations in designing hazard assessments, audits and safety inspections include who will conduct them, the time and expertise necessary, experience and additional training required, how often they will be performed, when they will be performed, and whether they will be announced or unannounced.

Getting results

Identifying unsafe work practices and hazardous conditions only has value to an organization if it uses that information to develop and implement corrective measures. To maintain the credibility of a safety program, managers need to address the identified practices with prompt follow-up.

But following up on recommendations should not end at the actual unsafe act or condition. Engineering and maintenance managers need to ask, "How or why did this event occur?" Correcting work practices and providing training will help prevent a reoccurrence.

If managers fail to follow up on employee recommendations in a timely manner, however, the whole system is likely to lose credibility.

Measuring performance

How can a maintenance department prove that resources used to improve safety are working?

Managers must address two questions: Are injuries, accidents and near misses reduced? Are workers' compensation and insurance rates lower? To show that safety pays, managers can highlight answers to these questions for everyone in the organization.

For programs to succeed, managers first must get support and direction from upper management. Once this support is in place, managers can develop the scope of the safety program and implement the necessary assessments, audits and inspections.

Once a program identifies hazardous and unsafe

conditions, managers must take timely action to address the problems to ensure the program's credibility.

Jeffrey C. Camplin, C.S.P., is president of Camplin Environmental Services Inc. in Rosemont, Ill.

Safety Pays: A Case Study

General safety inspections, accidents, and near misses can help identify the need for more focused inspections. Consider this example:

A large laboratory performing general safety inspections uncovered electrical cords from equipment hanging over work areas, presenting tripping and snagging hazards. A more thorough inspection revealed several incidents of employees tripping on cords while carrying chemicals resulting in spills.

The company held in-services to make employees aware of the hazards of dangling electrical cords. A follow-up inspection found that employees had secured long electrical cords by pinching them in draws.

This new action caused the cords to fray, exposing bare wires in areas where flammable liquids were used on a regular basis. A follow-up focus inspection identified the new hazard that was promptly corrected.

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Breaking News! Canadian Electrical Code change March 2024

Luke Begley

CEO & Co-founder @ CircuitIQ - "If you want to go fast go alone, if you want to go far go together!"

CE Code Rule 2-100 Marking of Equipment:

3) At each distribution point, circuit breakers, fuses and switches shall be marked, adjacent thereto, in a conspicuous and legible manner to indicate clearly

a) which installation or portion of installation they protect or control; and

b) the maximum rating of overcurrent device that is permitted

ADDITIONAL LANGUAGE TO BE ADDED:

4) **Where feeders or branch circuits are added, removed, or modified at an existing panelboard, the marking required by subrule 3) shall be updated**

In other words, subrule 4) is retroactive, effectively making the electrician performing any change to the panelboard responsible for the marking of the entire panelboard per subrule 3). Prior to this change taking effect in March 2024, an electrician making a change to the panelboard was only responsible for marking the item they have changed, now any change to the panelboard whatsoever makes that electrician responsible for marking the entire panelboard per subrule 3.

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Click Here to Register

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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
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Kenken Puzzle Answer

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

TEST YOUR OPERATOR IQ ANSWERS

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

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TUESDAY DECEMBER 12, 2023 AT 5PM FOR OUR IN-PERSON MONTHLY MEETING

Title: **Enhancing Building Efficiency: Hydronic Circulating Pumps**

Presenter: **Scott Krasman, Field Hydronic Specialist of Exel Systems Inc.**

- **Introduction**
- **A brief history on circulation pumps through the years**
- **Discussing the three key functions and their importance**
- **Reviewing the three most common pump issues and their respective impacts on building owners/operators**
- **Solutions for building owners**
- **Life cycle cost analysis**
- **Emphasizing the industry's growth as a collective**
- **Some Grundfos case studies highlighting relevant success stories**
- **Technical considerations for pump selection (limited jargon)**
- **A final summary & questions**

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We look forward to seeing you in-person for our meeting at the Danish Canadian Club (727 11 Ave SW) on Tuesday December 12, 2023 @ 5pm

Please visit the Building Operators Association of Canada YouTube Channel to watch the Speakers.

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