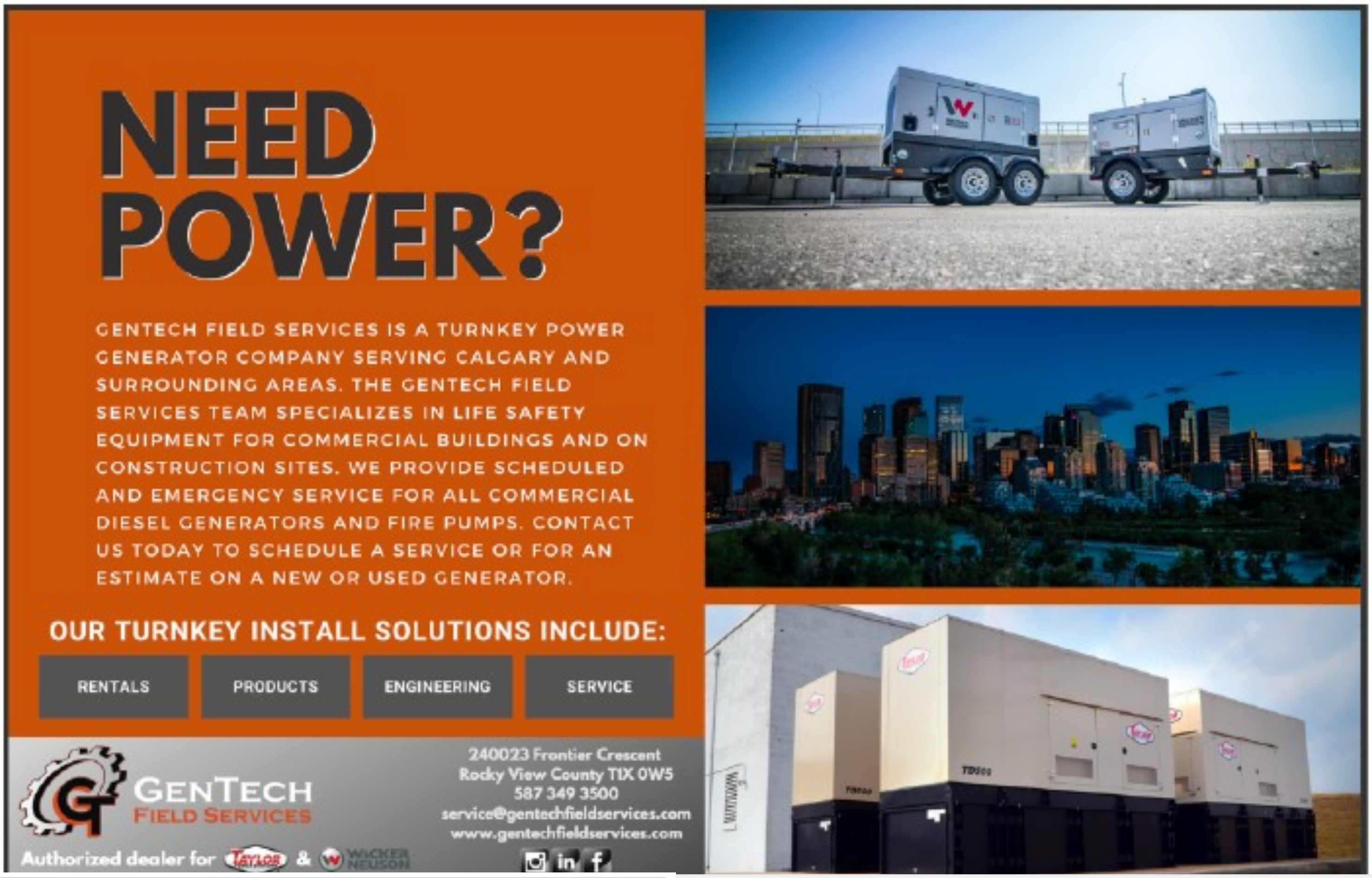
Volume 30 - Issue 5 - January 2024

BOA Building Operators Association of Canada

Official Publication of the Building Operators Association (Calgary)

January 2024


NEED POWER?
GENTECH FIELD SERVICES IS A TURNKEY POWER GENERATOR COMPANY SERVING CALGARY AND SURROUNDING AREAS. THE GENTECH FIELD SERVICES TEAM SPECIALIZES IN LIFE SAFETY EQUIPMENT FOR COMMERCIAL BUILDINGS AND ON CONSTRUCTION SITES. WE PROVIDE SCHEDULED AND EMERGENCY SERVICE FOR ALL COMMERCIAL DIESEL GENERATORS AND FIRE PUMPS. CONTACT US TODAY TO SCHEDULE A SERVICE OR FOR AN ESTIMATE ON A NEW OR USED GENERATOR.
OUR TURNKEY INSTALL SOLUTIONS INCLUDE:
RENTALS
PRODUCTS
ENGINEERING
SERVICE
GENTECH FIELD SERVICES
240023 Frontier Crescent
Rocky View County T1X 0W5
587 349 3500
service@gentechfieldservices.com
www.gentechfieldservices.com
Authorized dealer for


REGENCY CLEANING SERVICES
Janitorial Services
Window Cleaning
Pressure Washing
Specialty Services
Carpet & Upholstery
Move In / Out Cleaning
Floor Care & Maintenance
Post Construction Cleaning
PH: 403-520-7788 | FAX: 403-663-9911
info@regencycleaning.ca
www.regencycleaning.ca
ISSA MEMBER


HATCH COMPANY
ALFA LAVAL
Authorized Representative
Alberta's Authorized Representative for HVAC Heat Exchangers
- Plate & Frame, and Brazed Plate available
- New Installation & Retrofit applications
Wes Maxwell
wmaxwell@hatchcompany.ca
403-970-5663
www.hatchcompany.ca
HATCH Company
6715 - 8 Street NE, Unit 120
Deerfoot Atrium South
Calgary, AB T2E 7H7

Volume 30 - Issue 5 - January 2024

What's Inside?

Front cover by: Beautiful Canada

Important Phone Numbers

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

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

Volume 30 - Issue 5 - January 2024

President's Message

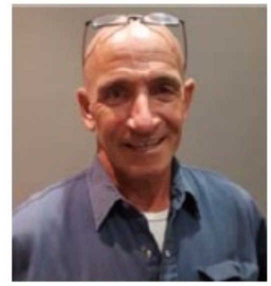
BOA Building Operators Association of Canada

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

We enter a new year with hopes and goals, maybe even a few new or renewed resolutions of how we can make our life better. It has been a trying few years and I hope the worst is behind us.

The need to make our facilities safe for visitors and tenants is important. The requirement for training our workers in how to perform their tasks correctly and safely is a responsibility under law. In areas where we don't have the expertise to perform certain tasks, we hire contractors to complete those functions. We try to mitigate responsibilities on large projects to others, by assigning "prime contractor status" making them responsible for their areas as it pertains to the correct methods of construction as well as keeping the designated areas safe for their workers as well as any subcontractors and visitors that they bring on to the site. That signoff does not entirely absolve us.

If an incident occurs, we cannot be totally distanced or protected from responsibilities. When construction is going on we should be touring the areas to be sure that what was contracted is being done. We are responsible to see that the job is done to our satisfaction and at the end of the day the contractor leaves and we stay. It is also the law that as a worker in the workforce, we have a responsibility for one another. If we see work being done unsafely, we need to make someone aware of it. Either report it to the manager or inform the worker of the unsafe act. We hire contractors to do certain tasks we are unable to perform, but some are not familiar with our buildings, so we need to make the area safe for them to do their job. It is also our responsibility to make sure our contractors are competent to do the work required of them. We need to assist them in securing the area to be able to perform the work required of them. To assure that they have the proper qualifications that their insurance is current. Even after that if an incident occurs the owners and managers can be held responsible in part or entirely for coverage of losses and fines incurred.



I am remembering the presentation of the John Petropoulos Society, where an emergency crew was called to a facility in the off hours and to a site in the dark, not completely made safe. A penetration on the floor was not made secure and in the dark John Petropoulos fell through to his demise. If you have not heard the story, it is heart touching and reminds us that we should never leave the site unsecured. We all want to go home to our families and friends.

We meet again in the new year on January 9th at the Danish Canadian Club (second floor) 727 11th Ave SW Calgary Ab, at 5PM. Please accept this invitation to visit and hear a guest speaker talk on the latest on high efficiency IR heaters for Entrances, Docks, Warehouses. Sandwiches, Coffee, and Good Company provided.

Smiles))

With kind regards,

Les Anderson PE, RPA


BGE
Indoor Air Quality Solutions
Clean Air Matters
We spend about 90% of our time indoors, and it has never been more important to ensure we have clean, healthy indoor environments.
For over 50 years, BGE's approach has focused on people, as we strive to provide optimal air quality through proactive, integrative advisory services and quality products you can trust.
BGECleanAir.com
Edmonton Calgary Vancouver Fort McMurray Prince George Regina Saskatoon Winnipeg


CPG CUSTOM POWER GENERATION
CANADA'S LARGEST BLUE STAR POWER SYSTEMS DISTRIBUTOR
Western Canada's Premier Supplier of Stand-by, Prime & CHP systems
24/7 Parts and Service Support
Emergency Generator Repair
Planned Generator Maintenance Programs
On Site Fuel Testing & Polishing
100% CANADIAN OWNED AND OPERATED!
CALGARY - EDMONTON - VANCOUVER
24HR: 855-948-8810 / CUSTOMPOWER.CA


SURE®
PRINT & COPY CENTRE AVENIDA
WE PRINT EVERYTHING!
SIGNS
RETRACTABLE BANNERS
X-BANNERS
SANDWICH BOARDS
& MUCH MORE!
DESIGN
NCR FORMS
MAGAZINES
BUSINESS CARDS
POSTCARDS
CALENDARS
LARGE FORMAT PRINT
LARGE FORMAT SCANS
BLUEPRINTS
501 - 12445 Lake Fraser Drive SE, Calgary, AB T2J 7A4
Phone: 403.254.6922 Email: sure20@surecopy.com
www.sureprintavenida.ca

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 25*

1. Equalizing lines on a condensate receiver float chamber:

a. will dampen level fluctuations

b. keep receiver level equal to boiler level

c. maintain make-up flow equal to condensate flow

d. eliminate the need for a make-up level control valve

e. maintains equal flow of condensate to multiple boilers

2. Heating plants with multiple boilers often have:

a. independent boiler feedwater control from a header

b. individual feedwater systems

c. feedwater pressure regulating valves for each boiler

d. separate condensate receivers

e. a common feedwater control valve

3. In nearly all LP steam heating systems the feedwater:

a. is usually condensate

b. requires daily close scrutiny of chemical values

c. is a high make-up percentage

d. must be deaerated

e. requires preheating in an economizer

4. The result of a condensate receiver which is too small could be:

a. high boiler water level

b. loss of condensate to the sewer

c. loss of make-up water

d. unacceptable high steam pressures

e. low make-up water flow rates

5. When a boiler equipped with a combination feedwater control and low-water cutoff device shuts down due to a low-water condition:

a. the feedwater flow will also stop

b. level must be restored to above the cutoff line before the unit can be restarted

c. it can be restarted by simply resetting the cutoff switch

d. a manual reset switch must be used

e. a pre-purge will not be necessary

Facility Managers Guide to Life Safety Emergency Power Standards – Part III

Bill Henderson

In our ongoing exploration of the CSA C282-19 standard for Emergency Electrical Power Supply for Buildings, we have examined the critical roles of regular preventative maintenance checks. As we progress to the third installment of this series, our focus shifts to the major semi-annual and annual inspections and tests. These comprehensive evaluations are not merely procedural but are integral in assuring the long-term functionality and reliability of emergency power systems.

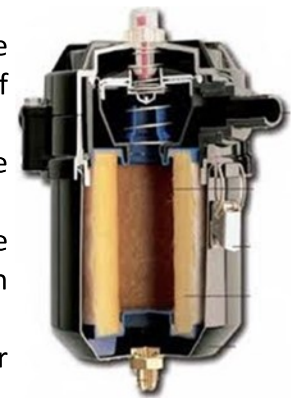
These periodic checks go beyond the surface level, delving into the intricate aspects of the emergency power systems. They serve as a health check, ensuring every component functions optimally and aligns with the evolving needs of the facility. From testing battery systems to examining fuel quality and system load tests, these semi-annual and annual procedures play a pivotal role in pre-empting potential failures and ensuring readiness for any emergency.

Remember that the essence of CSA C282-19 is not just about compliance but about cultivating a culture of safety and preparedness. This preventative maintenance plan aims to empower facility managers, engineers, and all stakeholders with the knowledge and strategies necessary for implementing these essential checks Thereby cementing our commitment to life safety and operational continuity in the face of unforeseen challenges.

At this point, it is important to emphasize that any competent maintenance staff member who is comfortable around operating machinery, is able to satisfactorily complete the requirements of the weekly and monthly generator tests. However, when it comes to the more involved tests and inspections, a trained generator service technician is required. There is a big difference between a person who can operate a generator and a person who can diagnose any faults to the point of recommending how to repair any deficiencies.

Complete the following semi-annual generator system checks:

1. Complete all items specified in Weekly (Part I) and Monthly (Part II) testing.



2. Inspect and clean engine crankcase breathers, if attached.
3. Inspect and clean all engine linkages.
4. Lubricate the engine governor and ventilation system.
5. Test protective devices for proper operation: over crank, overspeed, overload, phase unbalance alarms, temperature alarms, coolant level sensors, oil level sensors and so on.
6. Before start-up, perform two full cranking cycles. Near the end of each cycle (and while still cranking), measure and record the lowest indicated battery voltage. If the measured voltage is less than 80% of the battery's rated voltage, replace the battery. Alternatively, perform a battery load test using a suitable load tester.

7. Inspect ventilation system belts (ie. fan belts) for unusual wear and cracking.
8. Correct all defects found during inspections and tests.

9. Record all inspections, tests, and corrective actions in the log.

Complete the following Annual Service and Load Test items:

Complete all items specified in the Weekly (Part I), Monthly (Part II) and semi-annual testing requirements.

Control panel:

a. Open all inspection covers and inspect all electrical connections.
b. Test breakers for proper operation.
c. Clean insulators and bushings.
d. Test voltage regulator for proper operation.
e. Operate all moving parts to ensure that they move freely.
f. Clean and dress contacts as necessary.
g. Remove all dust.
h. Check gauge calibration.
i. For off-site fueled generators (natural gas), turn position-indicating gas valve to off-position to ensure valve rotates properly and that the audible alarm on generator control panel is activated.

Clean and well maintained Cummins KTTA50-G2 1500kW 4160v

3. Engine:

a. Change engine lubrication oil and filters.
b. Test strength of coolant and chemical protection level of coolant inhibitors.
c. Change fuel filters, clean strainer(s), and verify that the fuel supply valve is open.
d. Inspect the exhaust system. Check and record the back pressure of the exhaust system to ensure that it complies with the engine manufacturer's requirements and compare with previous readings.
e. Clean and lubricate linkages.

Best practices dictate that lube filters should have the date of change written on them with a Sharpie

f. Inspect air filters
g. Inspect all mechanical connections.
h. Inspect all electrical connections.
i. Inspect all external surfaces of heat exchanger(s) and clean as necessary.
j. Inspect all belts and hoses and replace if necessary.
k. Test and inspect ignition system(s). Replace any defective components.

l. Inspect coolant pump(s) for leaks and external

wear [if belt driven, remove the belt(s) first].
fail they can cook the coolant. Use the back of your hand when checking temp during weekly inspections to be safe.

4. Diesel fuel storage tank(s) - The fuel oil in any storage tank (and auxiliary supply tank, if used) shall be tested, and if the fuel oil fails the test, it shall be:

a. drained and refilled with fresh fuel in accordance with Article 6.5.1.5 of the National Fire Code of Canada; or

b. full filtered to remove water, scale, bacteria, and oxidized gums/resins in order to minimize filter clogging and ensure diesel start-up.

When the fuel is filtered, it shall be treated with a suitable conditioner and stabilizer to minimize degradation while in storage.

Most generator service providers offer this service with before and after filtration analysis to prove their efficacy.

After market diesel filtration system.

5. Generator:

a. Test surge suppressor and rotating rectifier on brushless machines.

b. Grease bearings (replace old grease with new) (if applicable).

c. Clean commutator and slip rings (if applicable).

d. Clean rotor and stator windings using clean compressed air.

e. Inspect coupling bolts and alignment.

f. Inspect conduits for tightness.

g. Inspect windings at rotor and stator slots.

h. Inspect all electrical connections.

i. With the generator set operating at full load, conduct an infrared survey of all electrical connections to identify any high-resistance connections.

6. Overcurrent protective devices:

a. Electrically isolate all overcurrent protective devices. Such as fuses, circuit breakers and protective relays.

b. Remove all dust.

c. Test devices for proper operation.

7. Transfer switches:

a. Isolate transfer switch, open all inspection covers, and inspect all electrical connections.

b. Operate all moving parts to ensure that they move freely.

c. Clean and dress contacts as required.

d. Remove all dust.

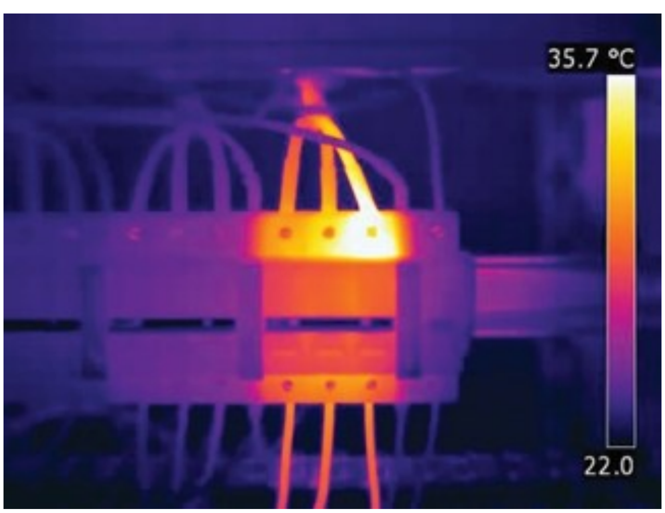
e. Clean and lubricate linkages.

8. Infrared thermal imaging:
A. Perform infrared thermal imaging of the normal power supply (preferred) side of each transfer switch. Ensure that the normal power supply side of each transfer switch has been loaded to at least 40% of the circuit rating of the normal power supply feeder for at least 60 min and that the load does not drop below 40% during the imaging. Scan all electrical connections, contacts, and energized components.

b. At the end of the 60 min load test, with the emergency power supply system (all components) still operating under at least 40% load, perform infrared thermal imaging of all components from the point where the load bank cables will be connected (for the 2 h full load test), through to and including the load side of each transfer switch. Scan all electrical connections, contacts, circuit breakers, and energized components.

c. After at least 60 min of the emergency generator full load test, with the emergency generator still operating under full load, conduct infrared thermal imaging of all components from the load terminals of each alternator through to the connection point for the load bank cables. Scan all electrical connections, contacts, circuit breakers, and energized components.

d. Correct any components or connections that displayed unacceptably high temperatures or unacceptable differences in temperature between phases, during the tests in Items a), b), and c) above.
e) Repeat the infrared thermal imaging for any components and connections that were serviced, repaired, or replaced following the scans performed in Items a), b), or c) above.

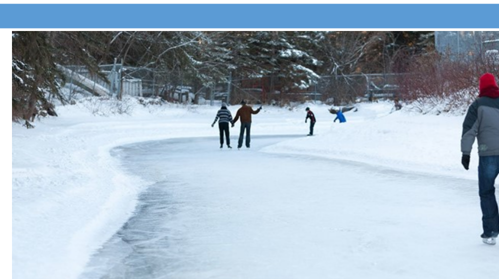


9. Lubricate door locks and hinges (if necessary), especially those of outdoor enclosures.
10. Conduct a 2 hour full-load test

No street access required suitcase load banks brought up to the roof to test a 2.2MW 600v gen-set.

11. As needed, review and provide instruction on the technical requirements for weekly, monthly and semi-annual inspections with the person(s) responsible for carrying out the work.
12. Correct all defects found during inspections and tests.
13. Record all inspections, tests, and corrective actions in the log

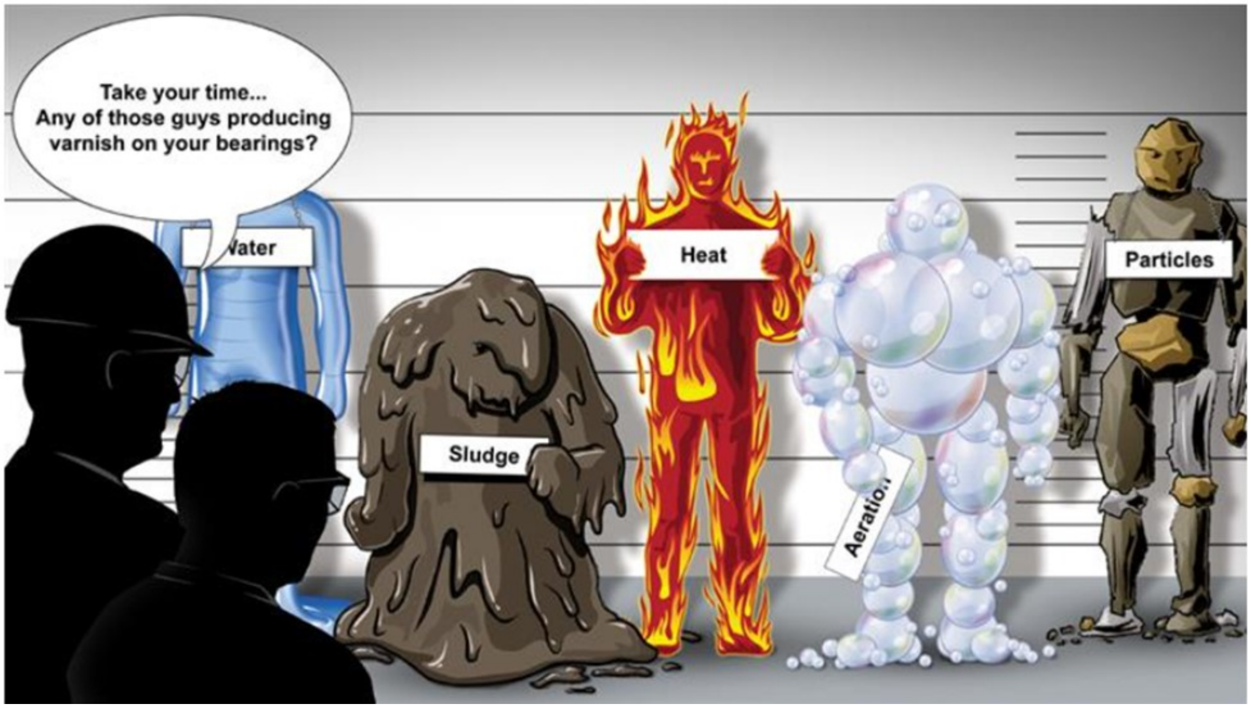
Article reprinted with permission



“Today, my son asked "Can I have a book mark?" and I burst into tears. 11 years old and he still doesn't know my name is Brian.”

Root Cause Analysis Process

by Jim Fitch



Knowing when a piece of equipment is going to fail (predictive maintenance) is much more difficult than making it last long (proactive maintenance). Even more complex is root cause analysis (RCA) which is performed postmortem, like an autopsy. Still, reliability professionals are increasingly stressing the importance of performing RCAs following all failures of critical machinery. As odd as it sounds, it is more productive to study failures than successes. After all, an apparent success may actually be a failure in disguise; more like a problem waiting to happen. Studying failures teaches us insightful lessons in developing predictive and proactive maintenance strategy.

Figure 1. Suspect Lineup

Root cause failure analysis is a process of working backward through a sequence of events or steps that led to functional failure of the machine. This process is often referred to as "Asking the Repetitive Why" or "the Five Whys". The first "why" is intended to reveal the obvious and more immediate cause, sometimes referred to as the direct cause. This is the suspect that first, and most often, bears the blame. However, by continuing the series of questions, one can often expose hidden causes that include contributing causes (partners in crime) and intermediate causal agents. With a little luck, your interrogation will lead you to the root cause. Keep in mind there may be multiple root causes.

Fishbone diagrams (also known as Ishikawa diagrams) are designed to guide a process of elimination from an evolving list of possible causes that answer repetitive "why" queries. To be successful, one needs not only the knowledge to identify all the possible causes, but also the savvy to eliminate the right ones from consideration. If you are a skillful forensic pathologist, for instance, you might be good at figuring out whether the subject died by poison or by natural causes and which poison or natural cause actually occurred. For the rest of us who do not perform autopsies for a living, figuring out the cause of death would be pretty much "mission impossible".

Many machine and lubricant failures are equally complex, enough so to confound even the most sophisticated failure investigator. I've seen RCAs heading wildly down wrong pathways or scrawny fishbone diagrams with all bones leading to dead ends. To help avoid such problems, the RCA process should be aided, where possible, by researching the histories of similar failures, deploying the use of faults trees and by following published troubleshooting guides. Better yet, consider hiring a machinery forensic pathologist.

Why the Bearing Failed

Some things are best illustrated by example: A bearing failed on a turbine generator train due to lubricant starvation (direct cause) from deposits that plugged the orifices through which the oil flows. In a postmortem study, the oil analysis lab found that the lubricant had oxidized leading to the deposit formation. The lubricant supplier was blamed for

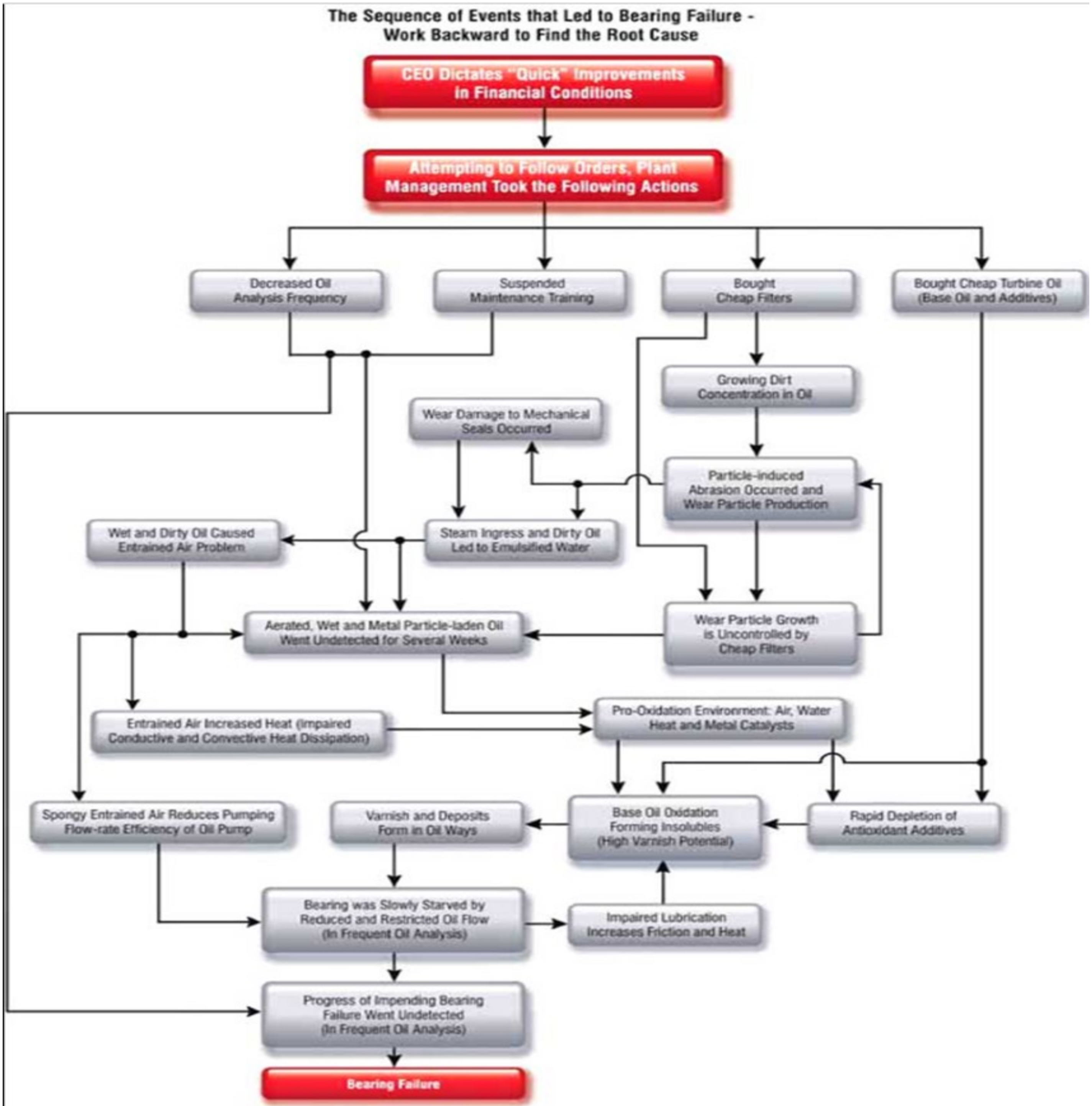


Figure 2. Sequence of Events

allegedly delivering a defective or poor-quality product.

1. Reacting to a directive by the company's CEO to quickly improve financial performance, plant management took many cost-reduction measures, including the purchase of economy-grade turbine oil and filters. Additionally, oil analysis was extended from monthly to semi-annual samples. The company also suspended all training for maintenance personnel.

2. The cheap filters allowed a high population of environmental particles to build up in the circulating oil system.

3. Wear, caused by the dirty oil, produced an increasing concentration of metal debris as well. The poor capture-efficiency of the filters allowed the metal particles to stay unchecked, causing even more wear.

4. The particle contamination led to seal damage and leakage, permitting the ingress of steam which later emulsified in the oil. The emulsification was further aided by the presence of the particles in the oil (polar emulsifying agents).

5. The combination of emulsified water and particle contamination weakened the air release properties of the oil, causing a rising air/oil ratio. Entrained air reduced heat-transfer (cooling) properties and decreased the flow-rate efficiency of the oil pumps, among several other problems.

6. The cheap turbine oil has a short oxidative life compared to premium lubricants owing to the selected base oil and additives in the formulation. The catalytic effects of water contamination and metal particles further shortened the oxidative service life (antioxidant additive depletion and base oil oxidation). Oxygen-carrying entrained air and rising heat further fueled the problem.

7. The conditions that led to the onset of oil oxidation went unnoticed by maintenance and operations personnel due to lack of training and infrequent use of oil analysis.

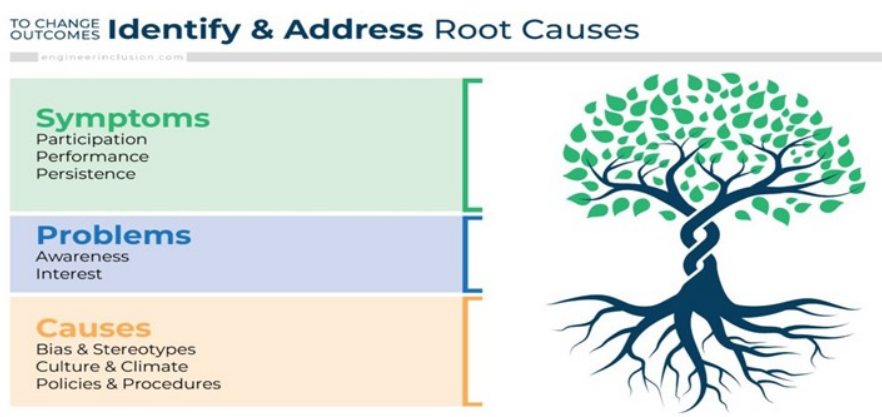
8. Soon, insoluble oxidation products began laying down varnish and deposits on critical machine surfaces including orifices, grooves and glands within the bearings.

9. Eventually, oil flow into the bearings became restricted causing impaired lubrication, increased friction and rising heat. The varnish compounded the problem by insulating the bearing surfaces from efficient heat transfer.

10. The elevated oil temperature combined with entrained air, metal particles and emulsified water, accelerated the rate of oil oxidation and deposit formation. Lack of training and oil analysis enabled impending bearing failure to go undetected.

With only a trickle of flow now reaching one of the bearings, the hydrodynamic oil film was disrupted, and the bearing failed completely.

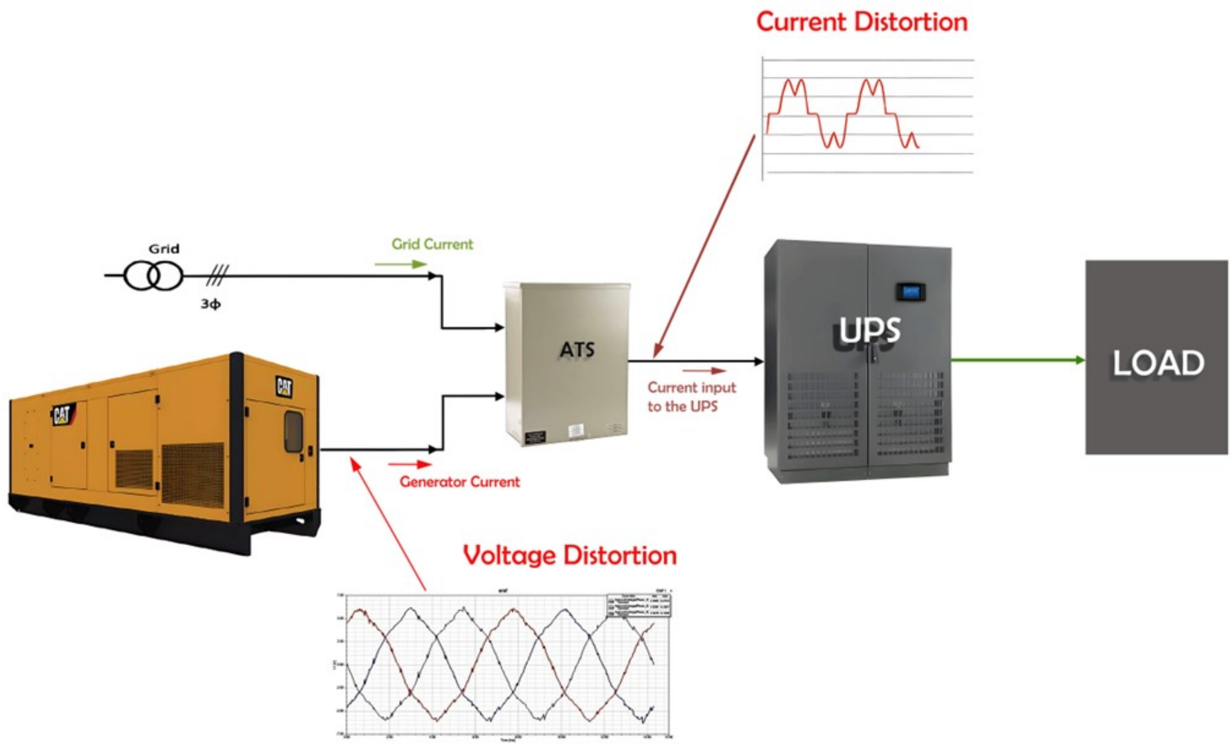
Many have said that RCA is more art than science. Indeed, it seems to draw from a range of skills, talents, experience and knowledge. Some investigators seem to have a special knack for it while others toil through the process. But even if an RCA is unsuccessful at uncovering the root cause, the process usually brings forth new knowledge and greater awareness of reliability risk factors to the team. This new knowledge can then be rolled into criticality studies, such as failure modes effects analysis (FMEA), leading to an overall improvement in machine reality. It's always wise to ask why.



Article reprinted with permission

The impacts of back feed harmonics from UPS on generator

Mohsen Abedi P.Eng, PSM.Eng



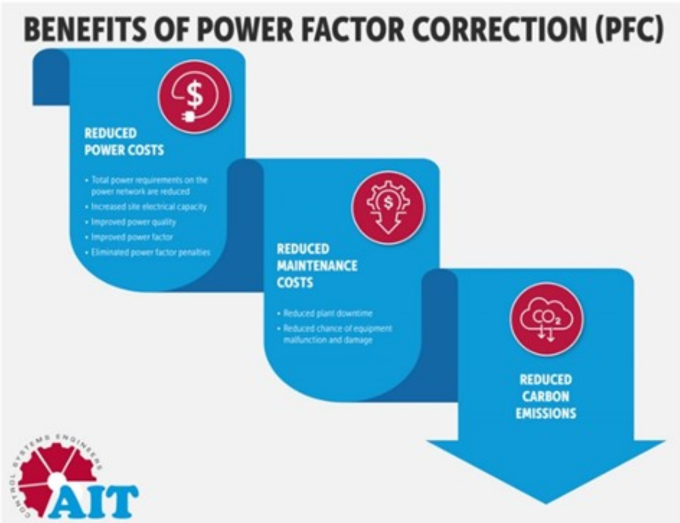
Input harmonics from a UPS can potentially cause issues with the operation of a backup generator, including misfunctions or performance problems. Harmonics are electrical distortions that result from nonlinear loads, such as certain types of power supplies found in electronic devices.

Here's how harmonics from a UPS can affect a generator:

1- Generator sizing: Harmonics can increase the apparent power (kVA) demand on the generator. Since harmonics cause the current waveform to deviate from a perfect sine wave, the generator may need to be oversized to handle the additional load caused by harmonics. Failure to properly account for harmonics can result in generator overload or overheating.

2- Voltage and frequency stability: Harmonics can affect the voltage and frequency stability of the generator output. When harmonics from the UPS interact with the generator, they can cause voltage fluctuations or distortions, affecting the quality of power delivered to connected equipment. The generator's voltage and frequency regulators may have difficulty compensating for these fluctuations, leading to unstable power supply to the load.

3- Control system issues: The presence of harmonics in the UPS input can interfere with the control systems of the generator. Harmonics can disrupt the operation of sensitive electronic components, such as voltage regulators or protective relays, which may result in malfunctions or improper response during load changes or fault conditions.



To mitigate the impact of harmonics from a UPS on a backup generator, consider the following measures:

1-Power factor correction: Implement power factor correction techniques in the UPS to reduce harmonics and improve the power factor. This can involve the use of active or passive power factor correction devices to minimize the harmonic content.

2- Filter the harmonics: Install harmonic filters between the UPS and the generator to reduce the harmonic distortion before it reaches the generator. Harmonic filters are designed to attenuate specific harmonic frequencies and can help mitigate the impact on the generator's performance.

3- Select compatible equipment: When choosing a UPS and a backup generator, consider selecting models that are designed to work together and minimize harmonics-related issues. Consult with manufacturers or experts to ensure compatibility and proper system integration.

4- Professional assessment: Engage the services of a qualified electrician, power system engineer, or an expert in harmonics and power quality to assess your specific setup and provide recommendations tailored to your needs. They can perform harmonic analysis, evaluate the system's compatibility, and propose appropriate solutions to minimize harmonics-related problems.

5- Regular Maintenance: Regular maintenance of both the generator and the UPS system is essential to ensure their optimal performance. This includes cleaning, inspecting, and testing the equipment to identify and address any potential issues.

6- Proper Sizing: Properly sizing the generator and the UPS system is crucial. The generator should be selected to handle the combined load of the critical equipment, including both the UPS load and the connected devices. Oversizing the generator can help compensate for the additional harmonic load.

By implementing these measures, you can help mitigate the potential negative effects of input harmonics from a UPS on the operation of a backup generator.

Article reprinted with permission

KenKen Puzzle

How to solve the Kenken puzzle:

(Answers on page 25)

- 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

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

Retrocommissioning Going Back To Get Ahead

by Stephen R. Wiggins

Improving energy management in existing facilities
Retrocommissioning institutional and commercial facilities properly can deliver a host of benefits to organizations. But starting the process can be intimidating for engineering and maintenance managers, in part because so much misinformation has been circulated about the process of commissioning existing facilities.

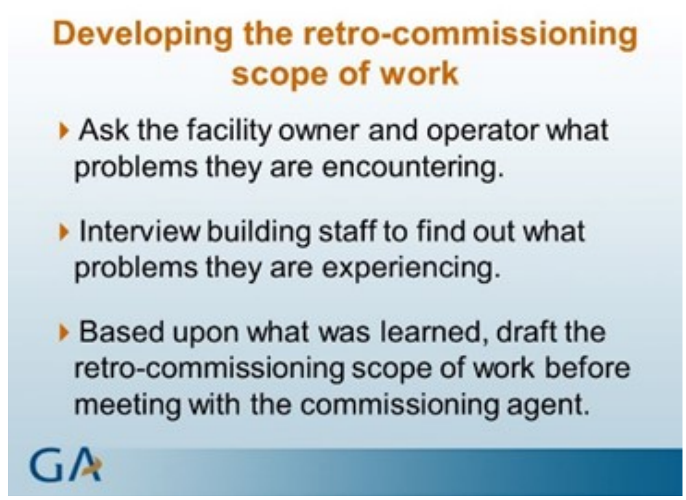
Managers cannot expect accurate and maximum results from the process without properly identifying the project's scope, carefully selecting a retrocommissioning professional at an appropriate time, and defining the success of the process.

Preparing a project's scope
A suitably written scope of work should clearly define the goals of the project, their due date, their format, and a manager's definition of a successful project.

Before selecting an outside retrocommissioning professional, managers must define the scope of the project. A few examples of reasons to retrocommission include improving poor building or system performance — especially critical-use facilities — reallocation of space, political considerations, and high energy costs.

Another element to consider in developing the project's scope is whether an organization plans to pursue LEED-EB certification through the U.S. Green Building Council. If so, a manager must evaluate the facility against LEED-based criteria.
Next, managers should identify, prioritize and rank their criteria for the project. For example, having a healthy indoor environment is one of the most critical criteria that managers use to assess a facility. Whether the facility is an office building, a learning center or a data center, facilities have to provide an environment in which clients can achieve their goals.

Each facility is critical in its own way. A data center that does not operate properly can result in significant loss of worker productivity and elevated



energy use. But an unhealthy learning environment in a classroom can be just as costly for students, teachers and the school's staff.

Next, managers must identify the systems to include in the project. In general, any facility system that experiences chronic problems should be part of the process. Most projects involve the HVAC system, and many include at least one of these systems: electrical, plumbing, fire alarm, vertical transportation, information technology, nurse call, pure water, and medical or laboratory gases.

After identifying facility systems, managers should determine the specific work limitations that might affect the project. These limitations might include: when technicians can perform the work, such as after normal hours, or only on weekends; security, such as clearance requirements for workers; and building-component issues, such as hard ceilings with limited access.

Finally, the scope of work should identify the process a manager expects to use. Each project has unique features and requirements that managers must assess separately, but a project matrix defining responsibilities serves as a good starting point. An experienced retrocommissioning professional can assist managers in this process.

Once managers have clearly identified these items, they can begin to write a proper scope of work. Visit the NEBB web site — www.nebb.org — for more information and examples of scopes of work.

Developing an RFQ

If a manager does not have a relationship with an experienced retrocommissioning professional, the next step is to develop a request for qualifications (RFQ). This document outlines the qualifications a manager is seeking in a retrocommissioning professional, such as experience on similar projects, experience, and references from other projects.

This document also should include the scope of work, as well as a request that the retrocommissioning professional provide a proposed implementation plan. Managers should evaluate all responses to the RFQ for their thoroughness and practicality.

When issuing an RFQ to multiple potential partners, managers should consider including a scoring matrix in the RFQ. Again, examples of retrocommissioning RFQs are available from a number of organizations, including NEBB.

Managers can identify a successful retrocommissioning professional through technical questions in the RFQ and a proper experience evaluation. They should contact each reference to ask detailed questions as a way of ensuring that facilities used as project examples by the applicant have continued to operate properly.

Selecting the right retrocommissioning professional can determine the success or failure of a project, so managers must be thorough and careful. The industry is rife with individuals claiming to be retrocommissioning professionals. Unfortunately, in evaluating their competency on technical issues, their credentials do not hold up.

True retrocommissioning professionals must have field experience in the proper startup, setup, and calibration of equipment. They also must have significant knowledge of system, subsystem, and system-to-system operations.

Without this experience, the retrocommissioning professional cannot properly test systems, identify deficiencies, make proper recommendations for corrections, and evaluate the appropriateness of the repairs. Theoretical training alone is not enough to provide an individual with the tools required to be a successful retrocommissioning professional.

Defining success
Many organizations use savings generated by one retrocommissioning project to fund future projects. For example, one manager established a retrocommissioning program by funding initial projects directly out of an existing maintenance budget. For the first three years, as operating costs declined in these facilities, one-half of the savings went to retrocommissioning, and the other one-half went back to the general maintenance budget.

For the next two years, one-fourth of the savings went to the retrocommissioning project and three-fourths went to the maintenance budget. As a result, the manager created a self-funding program that returned much larger benefits than just financial rewards. So when implementing such a program, managers must be certain that top management agrees in principal to the funding process.

If funds from energy savings are going to play a large part in the retrocommissioning program, managers need to measure and verify the levels of past and current energy use. Without historical data, no baseline exists from which to measure improvement. Historical data includes factors such as weather and occupancy levels, which then can be used to evaluate energy use.

Most retro commissioned facilities see annual energy savings of at least 10 percent, and energy savings of 20-30 percent are not uncommon. But saving money is not the only goal of the process.

For example, to achieve a healthy, comfortable indoor environment, ventilation air quantities often need to increase. Perhaps the outside airflow has been completely shut off, the air volume has been reduced, or building operators have used improper control sequences. But re-establishing required ventilation rates can drive up energy use.

So, instead of focusing solely on cost, the overall goal should be facilities that provide healthy indoor environments while using the least energy possible.

financial benefits from energy savings and occupant productivity. By clearly identifying a project's scope, turning results of the process into actual savings, and finding a means of sustaining a healthy and comfortable indoor environment over the life of the facility, retrocommissioning can yield an array of long-term benefits.

Finished Project as Training Tool
A central element in maintaining quality results from retrocommissioning over the long term is to use each project as a training class for an organization's maintenance technicians.

If this maintenance team is not involved in the process from the early stages through completion, a retrocommissioned facility will not function properly for very long.

So rather than having retrocommissioning teams constantly returning to a facility to fix problems, it is much more cost effective to implement training classes for the technicians who work daily in keeping these facilities operating efficiently.

These classes then will enable the retrocommissioning process to have longer-lasting effects on both a specific facility and other facilities in the organization.

Stephen R. Wiggins is a senior associate with the Commissioning and Operations Group of Newcomb & Boyd — www.newcomb-boyd.com. His work with the firm involves commissioning, retrocommissioning, operations and training activities for institutional, commercial, government and industrial projects.

Article reprinted with permission

Drive for Work Safely

Driving in winter can present challenges to even the best of drivers. For workers who have to drive as part of their job, there are a number of controls that can help mitigate hazards associated with driving. Some of these, such as checking road conditions before a trip, are especially important as we enter the winter driving season.

It's also important to know that when any vehicle – even a personal vehicle – is being used for work purposes while away from a work site, the vehicle itself is considered a work site under the OHS Act. In such situations, legislated employer and worker responsibilities to ensure work site health and safety apply.

Morning Meetings: Maintenance Planning and Scheduling

by Christer Idhammar

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

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

The worst-case scenario

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

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

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

Creating more effective meetings

To improve the effectiveness of your plant's morning meetings, I propose that you ask

yourselves some of the following basic questions:

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

Effective meeting characteristics

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

- The leader leads the meeting, and he or she can be distinctly heard throughout the entire room.
- The meeting starts on time and ends on time.
- Visual aids are used, and only information meaningful to the majority of the attendees is presented. Especially effective meetings present all their information using Power Point or other presentation software projected on a large screen.
- The meeting focuses on communicating important information, describing recent results and defining problems that must be solved.

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

No meetings?

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

Article reprinted with permission

Kenken Puzzle Answer

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

TEST YOUR OPERATOR IQ ANSWERS

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

JOIN US:

TUESDAY JANUARY 9, 2024 AT 5PM FOR OUR IN-PERSON MONTHLY MEETING

Title: **Innovations and High efficiencies in IR Heating systems**

Presenter: **George Niksic and Long Tran with Aqua Air Systems**

Presentation overview:

The main points will include:

1. High - efficient tube heaters (high intensity and low intensity)
2. New modulating IR heaters from Schwank
3. Monster HVLS Fans
4. How it benefits the end-user on energy savings. See attached for the brochure.
5. Schwank's climate system control.

BIO

George Niksic is a C.E.T, a graduate of SAIT's HVAC design program and the University of Athabasca in Business Administration. with 35 years experience in management, design and sales roles in the HVAC, Electrical and Construction industries. His current role is Business Development with Aqua Air Systems, and he is on the board of SAC—ASHRAE as the RP Chair.

Long Tran, a recent Mechanical Engineering graduate from the University of Calgary, currently an Engineer in Training (EIT). While relatively new to the HVAC industry, he brings a keen enthusiasm for learning and exploring different innovative solutions. In his current role as an Applications Engineer at Aqua Air Systems, Long is dedicated to expanding his knowledge. He is also an active member of ASHRAE.

Just for laughs!

BOA CALGARY OPERATOR MAGAZINE ADVERTISING RATES:

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

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

Advertisers Directory

Boiler Services **Black & McDonald**	**403-235-0331**
Drain Services Revive Pipes	403-903-4445
Engineering Services Building Envelope Engineering	403-287-0888
Filtration BGE Air Quality Solutions Ltd.	403-243-5941
Fire Protection Services Constant Fire Protection	403-279-7973
HVAC & Electrical Services Black & McDonald	403-235-0331
Indoor Air Quality Services Gasonic Instrument Inc,	403-276-2201
Motor Services James Electric Motor Services	403-252-5477
Power Systems Custom Power Products	855-948-8810
Supply Services DC Sales Corporation	403-253-6808

Support those that support

YOU!

Next time you are looking for a product or a service provider, please consider connecting with one of our advertisers & members of the Building Operators Association of Calgary

Alberta Certified Power Engineers Online Directory

Check to see when your power engineer certificate is due for renewal!

www.absa.ca/directories/alberta-certified-power-engineers-directory/


CONSUMER CHOICE AWARD 2015 SOUTHERN ALBERTA
8 YEAR
James Electric
Motor Services Ltd.
ISO 9001:2008 REGISTERED FIRM
COR
Professional Pump & Electric Motor Repair
35,000 Square Foot Service Center and Warehouse
In-House Machine Shop & Fabrication Departments
Fully Equipped Service Vans
Certified Hydronic Designer on Staff
Calgary's Largest Replacement Motor Inventory
Largest Stock of Pumps & Pump Parts in Western Canada
Custom Built Fans and Blowers to Meet Your Specifications
ISO & COR Certified
Consumer Choice Award 8 Years Running
All Service Technicians are Trained in Confined Space Entry
Fire Pump, Booster Pump and Sump Pit Annual Inspections Available
Energy Efficient Audits and Solutions
On Call 24 Hours, 7 Days a Week
Motors
A.O. Smith, Baldor, Century, Emerson, Franklin, Fasco, Lafert, Leeson, Marathon, WEG, Teco-Westinghouse, US Motors
Pumps
Armstrong, Albany, Barnes, Bell & Gossett, Burkes, Darling, Franklin, Goulds, Grundfos, Hydromatic, Liberty, Little Giant, Monarch, Paco, Taco, Tsurumi, Xylem
Fans & Blowers
Airdex, AirKing, Broan, Dayton, Delhi, Fantech, Fasco, Greenheck, Lau, Nederman, Nutone, Schaefer, Tjernlund
Variable Frequency Drives & Motor Controls
ABB, Danfoss, Baldor/Reliance, WEG, Santerno, Teco-Westinghouse, Tornatech
Accessories
Gear Boxes, Pressure Tanks, Gauges, Bearings, Mechanical Seals, Flow Indicators, Filter Housings, Filters, Flanges, V-Belts, Float Switches, Pressure Switches, Pulleys, Sheaves, Relays, Contactors, Pressure Reducing Valves
Are your pumps leaking money?
Booster Audit
We have ability to monitor water useage and power consumption to provide the following:
• A comprehensive pre audit booster inspection
• An energy audit with an estimate of annual energy savings and potential payback.
• The "scope of work" for the installing contractor
• Start-up and commissioning on site
• Yearly maintenance inspections
• On site service 24/7/365
Grundfos BoosterpaQ
• Most efficient cascade control, application optimized software in the industry
• Single source responsibility: One manufacturer for pumps, motors, drives and control
• Plug & Play - Easy to install and commission
• Large, clear, user friendly & advanced controls interface
• Reduced floor space footprint
• Ethernet & BUS communications option
• Drinking water approvals: NSF61/372, Hygenic designed 316SS manifolds
4020 - 8 Avenue S.E, Calgary, Alberta, T2G 3A7 www.jameselectric.ca motors@jameselectric.ca

Volume 30 - Issue 5 - January 2024

We look forward to seeing you in-person for our meeting at the Danish Canadian Club (727 11 Ave SW) on Tuesday January 9, 2024 @ 5pm

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

BOA Building Operators Association of Canada