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Building Operators Association of Canada

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LEST WE FORGET

Important Phone Numbers

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

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President's Message

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

The Building Operators Association will delay the trade show to the spring. We send regrets and will try to arrange it to not coincide with the oil and gas shows that typically run the spring dates. I will contact the companies that made inquiries to let them know of the proposed schedule.

By now you should have received the membership dues notification. I hope you will process it asap. It is our source of revenue that allows us to continue. Please, support us as we support you.

The Building Operator BOMA 5th class course starts up this winter, January 7th 2025 and again it will be three hours on Tuesday and Thursday evening from 5PM to 8PM the duration of the course will last for about 5 months (150 hours). Successful Graduates will be able to write the government exam. Because the course is virtual it doesn't mater from where in Alberta you are. We had a student take the course who was living in Ontario and was preparing to move to Alberta. To register or inquire about the upcoming course please contact the BOMA office at 403-237-0559.

I have met over the last few years Building Operators like me, who work this career as a part time job. That even though I spent a whole career working every day as a Building Operator. I still enjoy the feeling of seeing a building running well, of satisfying customers. As a part time Building Operator, I can manage a small contract and take time off to do what I want. This "Gig" can be as a subcontract with a control's contractor or a general contractor. It allows you the freedom to do what you do best, operate Buildings and then take the time off to go fishing, hey, it works for others, and it works for me it can work for you too!

Les Anderson

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TEST YOUR OPERATOR IQ!

Are you equally adept at troubleshooting problems in the boardroom and the boiler room? As the resident facility guru, there's a lot riding on whether or not you know the difference between sounds control and a sound investment.

Try our monthly Operator IQ challenge...*answers on page 21*

1 Hot water heating boilers must be equipped with a:

a) thermometer
b) fusible plug
c) return trap
d) blow down tank
e) steam pressure gage

2. How are stop valves, which are used on steam outlet connections of heating boilers, identified?

a) they are stamped
b) they have catalogue numbers
c) with identification numbers
d) with stickers
e) with metal tags

3. How many pressure relief valves shall a hot water heating boiler have?

a) none
b) at least one
c) at least two
d) at least three
e) at least four

4. If a boiler with an automatic feedwater system requires a large amount of water to be fed manually, this may indicate:

a) you are producing a great deal more steam
b) there is probably a leak in the system
c) there has been a drastic change in the water quality
d) your return lines are not working
e) the flow meter is not working properly

5. In a closed expansion tank system an air separator:

a) removes air from the system
b) is installed at the boiler inlet
c) is installed at the boiler outlet
d) directs air into the expansion tank
e) is not required

21st Century Boiler Controls

by James Piper

Wave of computerization sweeps boiler operations into the digital age

A FUNDAMENTAL CHANGE is taking place in the way boilers are controlled, operated and maintained. Following the computerization trend that moved through the temperature control industry over the past 10 years, boiler controls are going digital. Manual and pneumatic control systems are giving way to the microprocessor. Intelligent field devices and programmable logic controllers are replacing gauges, hand valves and pneumatic actuators. The results of these changes include better performance, improved safety, enhanced maintenance and lower operating costs. They are the result of several key features of new control systems, including centralized operation, remote capabilities, enhanced diagnostic tools and an emphasis on energy efficiency.

Centralized operation

Digital control systems bring all monitoring and control operations into one location. When conditions call for a change in system operations, those changes come from a central console. Gone are installations in which multiple boilers have individual control panels. Single and multiple boiler installations now can be run from one location. The result is increased system efficiency and faster response time for operating personnel. Centralized operation found with digital control systems shouldn't be confused with what is common in many large steam plants that operate multiple boilers. Many such plants have pneumatic and electric control systems and a central monitoring station, typically located in the superintendent's office. The primary purpose of these systems, however, was to inform the superintendent of the boilers' status. They weren't designed to provide the same level of monitoring and control that can be achieved with digital systems. For example, most modifications to boiler operation still require that an operator go out to the boiler to make the adjustment. With digital systems, operators can make most adjustments from the central console, often automatically. Centralized reporting and control functions in the boiler system provide another edge: The boiler system and other operations within the facility can share data. For example, current and projected weather conditions and the occupancy schedule can be used to determine if more boilers need to be brought online.

Remote capabilities

One major advantage of new-generation boiler controls is they can be remotely monitored and controlled. With conventional manual and pneumatic systems, remote monitoring was limited to a few gauges, charts and graphs, usually in the plant manager's office. With digital controls, no such limit exists. Through a PC connected to the system, personnel instantly can access all system data points and monitor boiler operation. Using a modem, a remote computer can be located nearly anywhere there is a suitable telephone jack. Remote PCs are not limited to simply monitoring the status of the boiler system. Any control function that can be performed locally also can be performed remotely. Even diagnostic operations can be initiated from the remote location to help troubleshoot operations without having to call in operators. Some systems

include a connection to a telephone-operated paging system. In the event of a boiler system alarm or malfunction, the control system can automatically page operators in nearby or remote locations, permitting more efficient use of operating personnel's time.

Enhanced diagnostic tools

Conventional boiler control systems typically monitor less than 10 operating parameters of the system. Of these points, only a few are tracked over time. As a result, when problems in the boiler's operation occur, little information on the events leading up to the malfunction is available. In contrast, digital-based boiler control systems typically monitor about 80 system parameters. Any parameter can be logged by the system and tracked over time. These additional data points can help operators identify problems as they develop and provide operators with additional data to help troubleshoot system operations. They even can be used to help diagnose problems that are slow to develop, over months and even years. For example, key boiler operating characteristics - feedwater, fuel bum, blowdown and steam generation rates - can help estimate overall boiler efficiency at that particular load. If the boiler is in good condition and operating properly, estimated efficiencies shouldn't vary significantly over time for the same load. A digital-based control system provides a way to compare the performance of the boiler under a range of loads and for the same load over months or years. If the performance varies greatly, operators can begin the process of tracking down the causes.

Energy efficiency

Use of a digital boiler control system improves operating efficiency at all loads, but particularly at part load, where conventional control systems cannot closely manage boiler operations. Conventional control systems suffer from two major sources of error that impair operating efficiency:

• Offset occurs when the control system operates the boiler close to, but not at, the desired setting.

• Overshoot occurs when the control system overcompensates for a change in operating conditions, such as load or system pressure, and overshoots the desired setpoint. The system, sensing it has overshot the desired setting, overcorrects in the other direction, leading to a condition called "hunting."

These errors result in decreased system performance and increased energy use. All are virtually eliminated by using digital control systems. These systems automatically adjust burner fire rates to match changes in system loads in increments as low as one-tenth of a pound.

The future

Today's systems use proprietary hardware and software. Once installed, the boiler owner is locked into the original system manufacturer for modifications. Proprietary systems once dominated the building automation industry, but pressure from owners and building trade associations launched the development of standards governing how components connected to the system, how sensor and control signals were transmitted between the computer and the sensing devices and actuators, and how software operated. Look for the same standardization to take place in boiler control systems. Besides providing greater flexibility at a lower cost, standardization will allow boiler control systems to interface more readily with other building control systems. Operators also can expect to see increased system intelligence. In spite of the power of digital systems, system manufacturers and operators are pushing for more capabilities. Many will come from intelligent field devices; self-contained microprocessor-based sensors, transmitters, and actuators that will perform many functions now done by the central computer.

Finally, look for systems to have software built into the system to aid in training. Ease of operation has always been a strong factor promoting the use of digital control systems. Their near fully automatic operation, coupled with well-designed graphical interfaces, makes learning basic operation of the system relatively easy. But while basic operation is relatively easy, making full use of the system capabilities requires that the operators spend a significant amount of time undergoing training.

James Piper, P.E., Ph.D, is with the University of Maryland.

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Equipment Rental and the Bottom Line

by Thomas A. Westerkamp

A careful examination of maintenance project requirements and the true cost of rental can help managers meet budget demands

Maintenance departments often undertake slightly larger construction projects as a way to more effectively control project costs and work quality. To achieve these goals, managers must understand their options when it comes to renting key pieces of equipment, including generators, power tools, earth-moving equipment, lift equipment, and pavement maintenance tools.

Before doing so, however, managers face a host of important equipment-related issues, and they must consider how to provide worker training and safety, as well as whether to buy or rent equipment.

The first step in renting equipment to use on in-house construction projects is to evaluate the nature of the project and the conditions under which the equipment would be used.

The nature of the project includes considerations of function and capacity. What functions and capacity will the project require? For example, erecting a second-story building addition requires break existing concrete with a pneumatic jackhammer, digging down to clay with an excavator, and pouring a concrete footer using ready-mix concrete.

Next, crews need to install brick pilasters or H-columns on the footer to support the new upper floors, walls and roof. If specifications call for a clear span, pre-stressed concrete double-tee roof, then the required truck crane must perform multiple tasks, including lifting pallets of brick or H-columns, I-beams, rebar and forms for upper floors, sprinkler piping, pre-stressed concrete tees, insulation, and other roofing materials.

So the crane's capacity must include enough height, reach and weight for the most demanding of these lifting jobs. Its height will have to be enough to lift the pre-stressed concrete above the roof to place it on the supporting I-beams. The reach has to be enough to place the double-tee lifting hook at the centerline of the building addition and access to the farthest H-column footing.

The tasks will require a crane with a double-pivot, boom-and-stick arrangement and the ability to rotate 180 degrees from the load lay-down area to the installation position for double tees. The crane's design will have to enable the outriggers to balance the load at its farthest reach with the heaviest weight.

Not many departments have such equipment for heavy lifting, and because the entire roof deck will take only two or three hours to place on the steel, for example, this application would ideal for equipment rental.

Various lifting tasks occur intermittently throughout such projects, so managers can rent various pieces of equipment best suited to each task for shorter intervals and pay only when needed. Even though the hourly rate for equipment and operator might seem high, overall project costs can be lower than if the organization buys the equipment.

Worker training and safety

In the example of the rental truck crane and crew, the equipment vendor would have provided training and safe operation, since the trained crew would be

included in the hourly rate. The rate also would include important general liability insurance and worker-compensation coverage paid for by the vendor covering the crew while on the project site.

In cases where this coverage is not included, such as in an equipment-only rental, managers must perform due diligence in providing for training and safety. Owners' manuals, instructors, and training facilities and equipment are among the considerations managers must address to ensure proper training.

Operating the equipment is not the only important consideration for safe use. The operation and maintenance manuals also specify important information about requirements for setting up and inspecting equipment, safety devices that must be in place, instructions for using them most effectively, and ongoing maintenance technicians should perform before, during and after use.

The key to proper and safe operation is a thorough inspection before each use. Even with rental equipment, project managers must be diligent in ensuring the operator or mechanic performs a complete inspection of all controls and safety devices, and that these features are in good working condition and in place on the equipment as provided for in the operating manual.

Workers should not be afraid to report problems uncovered by inspections. For example, if a crane hoist has frayed wire cable or does not have all its outriggers, send the equipment back and get a replacement. Also, attachments not authorized by the equipment manufacturer — especially those that inhibit proper operation of safety devices and controls — should be forbidden to use on the equipment. A good rule is that if it is not in the manual, it shouldn't be on the equipment.

To buy or rent?

Deciding whether to buy or rent equipment can be tricky because the decision involves so many factors.

Many managers might opt to buy a general-purpose item, such as a crane or personnel lift that crews use often. If so, they can prorate the cost over many projects performed in the course of a year. Another situation where a purchase makes sense involves equipment that must be instantly available, even if it is not used often. Such equipment includes a standby generator set to automatically switch on in a storm-prone area where power outages might be very costly or damage other expensive equipment.

With a purchase, there are no costs for pick-up and return, and the unit is available on no or little notice. Also, managers can set up a depreciation schedule to write off the cost over the item's life. If the department has a trained operator and mechanic on site and can inventory any needed spare parts, any inspections and repairs can be performed onsite between uses.

With the rental option, the transaction is all expense, no capital costs. Managers can conserve capital for other potentially more profitable investments. For example, renting a popular scissor lift costs about $400 per month, whereas purchasing the same unit costs about $10,000. Managers who opt to rent end up with equipment that has exactly the required specifications, rather than having to compromise by using available equipment.

Also, tracking equipment expenses on the project involves just the vendor's all-inclusive monthly rental and periodic delivery and return costs. In-house training and mechanic requirements are lower, since the vendor performs maintenance. No spare parts are required, saving inventory cost and space, and the department doesn't have to worry about equipment history and spares inventory recordkeeping.

And if the supplier is nearby, downtime costs might be reduced because if a breakdown occurs, the vendor can replace inoperative equipment with another unit. Managers also don't need to worry about license fees or registration requirements, and if the vendor provides the operator, the vendor also handles insurance and workman's compensation costs.

If most issues in the rent-vs.-buy decision seem to be an

even trade-off, cost comparison might be the deciding factor. To determine which option is more economical, managers can compare the cost of renting to the cost of purchasing for a specific equipment item. To make this comparison, managers need to know the quoted purchase price, resale value, years of use, and annual use hours, then compare them to number of months of rental per year, rental cost per month, and cost of pick-up and return.

The purchase cost is the total of ownership and operating costs, and the cost to rent is the monthly rental cost added to pickup and return costs for the same period as the purchase. Purchase cost details include depreciation, interest, overhead labor, overhead parts, and trade-in or resale value. Operating costs associated with ownership include labor, parts and fuel.

Rental costs include the monthly rental cost multiplied by the number of months per year used times the number of years included in the purchase calculation. To determine total rental cost, multiply delivery and return costs by the number of uses in the years used in the purchase option. Comparing these two totals yields the variance amount and shows which option is the most economical.

Partnering on rental

Before selecting an equipment rental partner, managers would be wise to visit the vendor's facility to observe the operation. Do not be drawn automatically to the lowest bid. Instead, compare the value.

Check the cleanliness of the shops and equipment storage areas, as well as the condition of the rental equipment itself. Observe the maintenance technicians working on the equipment to evaluate their skill levels as they inspect and adjust the equipment.

Look for safety signs and guards. Do technicians properly use personal protective equipment, including hard hats, safety glasses, ear protection, and gloves? Is the spare parts storeroom neat and well organized?

Whether renting lift trucks, earth-moving equipment, paving equipment, generators or power tools, managers should take note of dirty, disorganized work areas, as well as equipment, tools and parts that are scattered around. These are not good indicators that rental equipment will be well-maintained and trouble-free when it arrives at the job site.

The final step is to have a customer service representative explain the vendor's inspection procedure in preparing a unit for delivery to a project site.

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Possibilities of Infrared Scanning

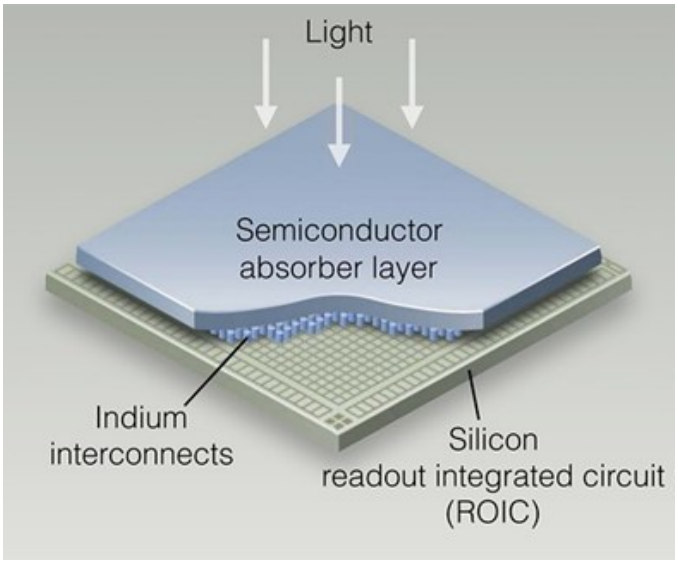
by Grant J. Eliuk and Mike Perry

INFRARED DETECTORS / IMAGERS

Infrared detectors/imagers can be used for a variety of applications in the construction and maintenance industries. Since infrared radiation does not rely on visible light, it offers the possibility of seeing in the dark or through obscured conditions, by detecting the infrared energy emitted by objects. The detected energy is translated into imagery showing the energy differences between objects, allowing these objects to be seen. There are a great number of areas where infrared thermography can be of benefit in almost any facility. These can be broken down into several major sectors.

Condition Monitoring

- Electrical - production, transmission, distribution, switchgear, panels.
- Mechanical - motors, pumps, various rotating equipment.



Buildings & Structures- insulation, air infiltration, roof leaks.

Process Monitoring and Control

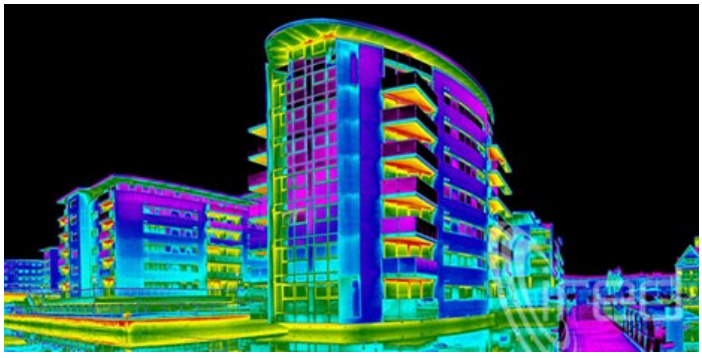
- Refractory
- Steam Systems
- Petrochemical Processes
- Automotive Industry Process
- Metal and Plastic Processing

Quality Control and Quality Assurance

- Electronics design, verification, mass screening, diagnostics
- Mechanical Assemblies -malfunction and failure analysis

Non-Destructive Materials Testing

- Cavities and Inclusions in Solids
- Composite Delamination



- Subsurface Corrosion Detection
- Moisture Detection
- Concrete Bridge Deck Delamination

Thermal Night Vision

- Security
- Surveillance
- Search & Rescue

Research and Development

- Heat Plow Studies
- Biological Studies
- Air Movement Studies
- New Product Evaluation

ADVANTAGES OF A CONDITION MONITORING SYSTEM

- Lower maintenance and production costs
- Reduced unscheduled production downtime
- Extends maintenance repair intervals
- Lower probability of catastrophic failure
- Increased personnel safety
- Reduced insurance rates
- Reduced spare parts inventory
- Unnecessary repairs minimized
- Maximize plant availability
- Maintenance or repairs can be planned for non -peak production periods
- Improved coordination of maintenance efforts
- Optimizes staff size
- Biutilization
- Improved production quality
- Speeds up production output
- Improved communication and decision making
- Improved equipment design
- Competitive advantage

Undoubtedly there are major benefits to be derived from implementing a condition monitoring program in any facility. With electrical equipment, machinery and labor costs rising, managers, engineers and technicians alike must turn to condition monitoring technology for assistance to maintain their competitive advantage. In a survey of 557 manufacturing and process facilities that have introduced a condition monitoring program, the following average improvements were made:

- 28% increase in maintenance productivity
- 19% decrease in material cost
- 18% reduction in spare parts inventory

In addition to quantifiable cost savings, 76% of the respondents cited improved relationships between management, maintenance organizations and operations departments. These are the reasons why more and more companies are taking advantage of technology such as Infrared Thermography. Condition monitoring utilizing Infrared Thermography is a WIN-WIN situation for everyone involved.

IR/T is currently experiencing rapid growth as more and more electric utilities and industrial sectors are embracing the technology. The reason for this growth is that company personnel are understanding the benefit of this non-contact, nondestructive method. The primary benefit is to find deteriorating components prior to catastrophic failure. Thermography provides a "different set of eyes" allowing a whole new level of diagnostic aid and problem solving.

INFRARED CONDITION MONITORING

Temperature and thermal behavior of power generation and distribution equipment as well as industrial machinery and processes are the most critical factors in the maintenance of operations. Temperature is one of the first observable parameters that will indicate the operating condition of a component and is by far the most measured quantity in an industrial environment. For this reason, monitoring the thermal operating condition of electrical and mechanical equipment is considered to be the key to any successful predictive maintenance program.

Infrared Thermography (IR/T) is a condition monitoring technique used to remotely gather thermal information for monitoring the condition of the entire electrical system from generation, distribution to end user.

Since all equipment (when operating) has a normal operating thermal signature, IR/T allows this signature to be recorded as a baseline measurement. Once this is established, IR/T over time will reveal the thermal differences deviating from the norm. This abnormally localized radiation (anomaly) can either be an over heated condition or lack of heat. This information is then reviewed and the decision is made to plot the temperature change with time and/or the repair can be initiated at the most efficient time. The information gathered can be stored and Illy analyzed, providing complete predictive maintenance capabilities.

CONDITION MONITORING PROGRAM

A condition monitoring program, properly implemented, is an important tool for modem facilities. The total maintenance cost in most plants will range from 15 to 40 percent of the total cost of goods produced. It is the single largest contributor to controllable cost in most manufacturing and process plants. It also has the largest potential for improved availability and profit in industry today.

Independent surveys indicate that North American industry spends more than $200 billion dollars each year on maintenance and that more than one third, or $60 billion, is wasted as a result of unnecessary or improper maintenance These surveys also confirm that reactive (after the machine failure) maintenance will cost an average of three times more than the same repair performed using the advance notice provided by condition monitoring techniques. The forewarning of incipient machine or system problems provided by a condition based predictive maintenance program is invaluable in saving money.

IR/T Electrical Inspections - A Brief History

The main application for thermography has always been electrical system inspections. In 1965, the Swedish Power Board began IR/T inspections. In 1976, the UK Electrical Generation Board began utilizing IR/T for predictive maintenance on their transmission lines. Canadian companies such as Ontario Hydro and B.C. Hydro also became involved with IR/T during this period.

Over the years, IR/T has proved itself as valuable tool for electrical inspections. Electrical problems manifest themselves by emitting increased heat energy. The new generation of IR scanners can easily detect and image this information. IR/T has now been implemented in virtually every major industrial setting to provide valuable information for condition monitoring and

preventive maintenance.

Return on Investment

The costs involved in implementing an 11~ITT condition monitoring program are dependant on several factors. These include:

- Facility size.
- Facility type.

Complexity of monitoring program desired. IR equipment and training either contracted out or acquired internally.

Industry in general has begun to recognize IR/T inspections as an invaluable tool. The financial savings generated by IR/T programs through increased safety, productivity and efficiency are well documented. The cost of hiring an IR inspection company is fractional compared to these savings.

Conclusion

The benefits of a properly implemented IR/T inspection program are hard to ignore. Companies hoping to maintain a competitive edge must stay current with technology. While certainly not new, IR/T is just beginning to reveal how useful it can be to all areas of industry. By reducing maintenance costs, down-time and catastrophic failure, IR/T customers will continue to enjoy a strong bottom line.

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KenKen Puzzle

How to solve the Kenken puzzle:

(Answers on page 21)

- 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

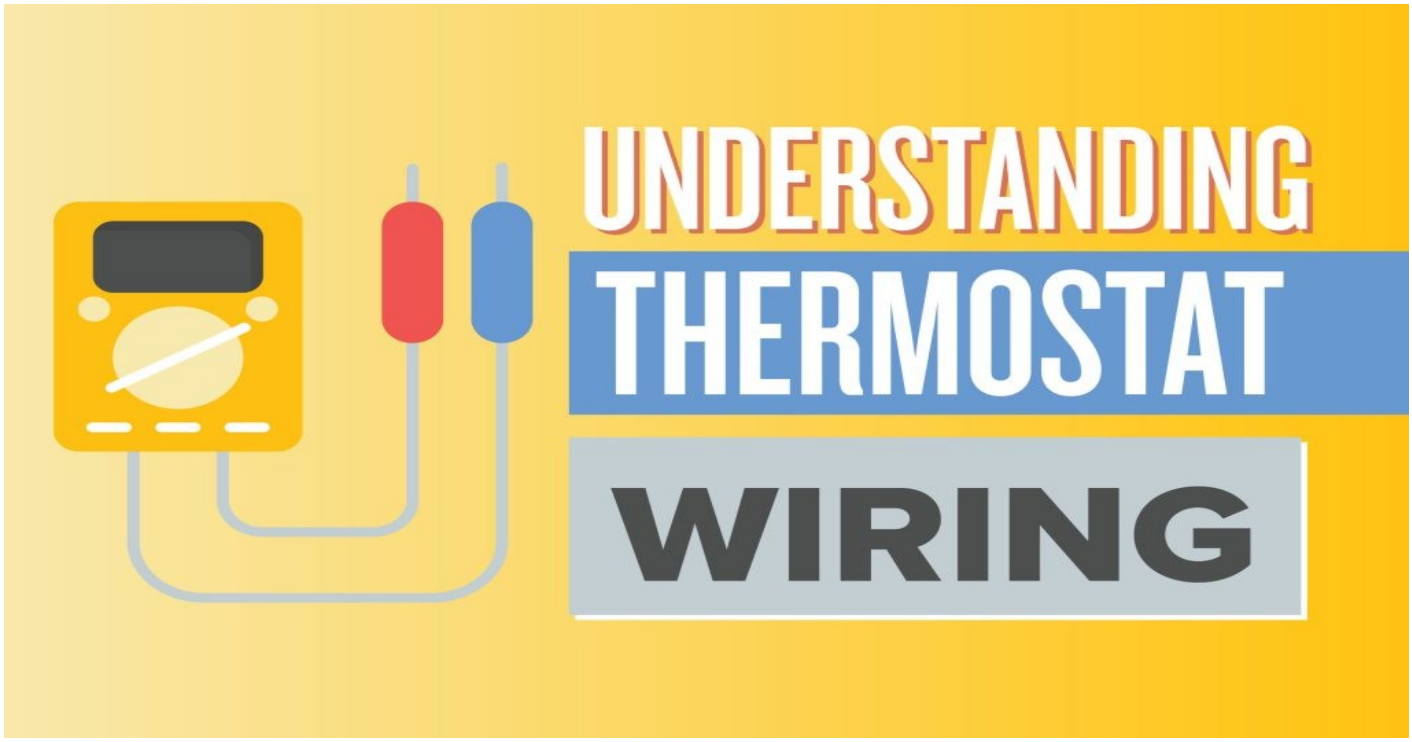
			5	2	6			3
			7			1		
	3			8				5
7				4		9		6
						2		
	5	9	8		7			
	9	7	3					
3								7
	4							1

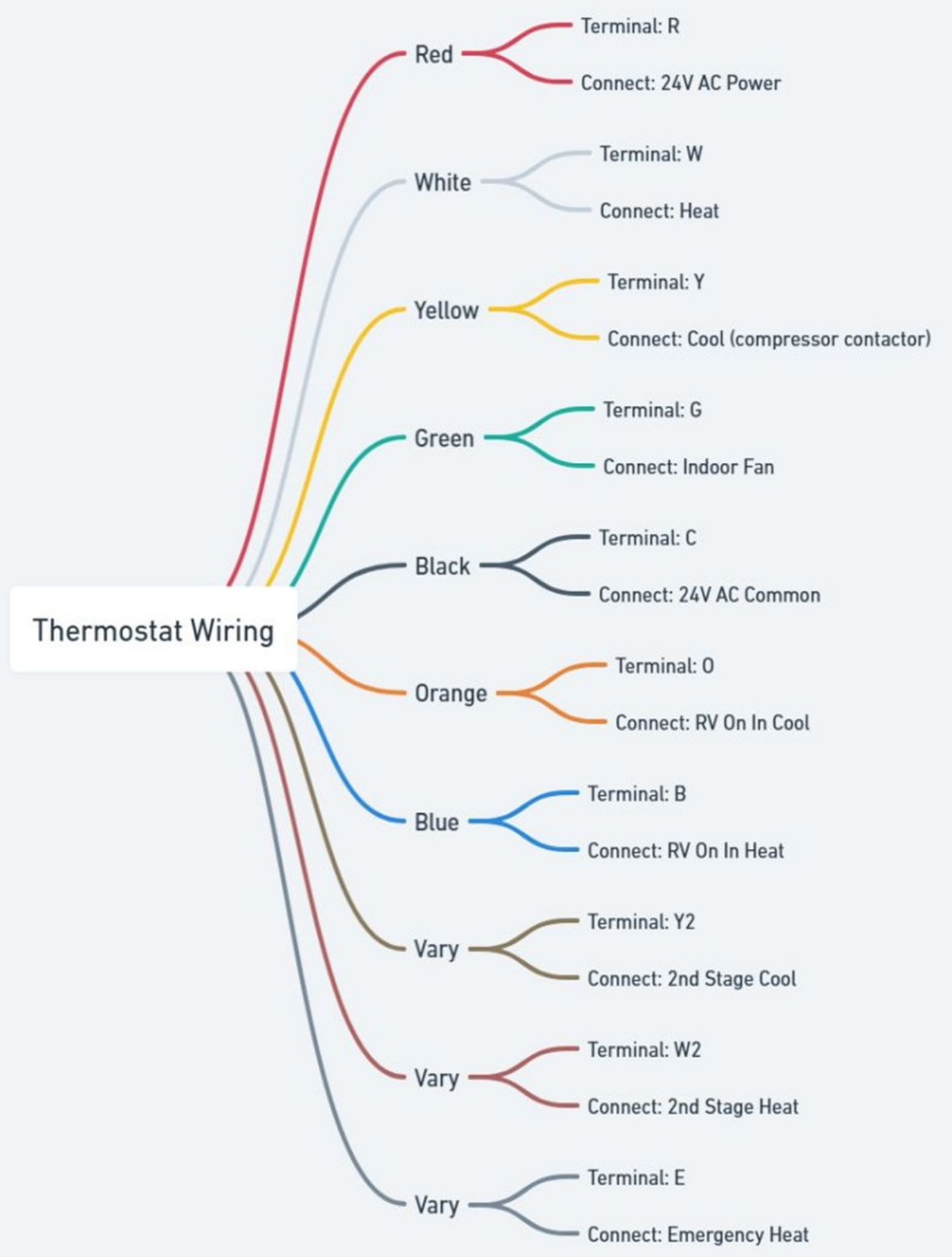
Thermostat Wiring Essentials for HVAC Systems

In facility maintenance and HVAC, understanding thermostat wiring is crucial for technicians and facility managers. Here's a quick breakdown of the essential wiring connections:

- Red (R) – Provides 24V AC power.
- White (W) – Controls the heat.
- Yellow (Y) – Activates cooling through the compressor contactor.
- Green (G) – Engages the indoor fan.
- Black (C) – The 24V AC common.
- Orange (O) – Reverse valve for cooling mode (RV On in Cool).
- Blue (B) – Reverse valve for heating mode (RV On in Heat).
- Varying Colors (Y2, W2, E) – Handles 2nd stage cooling, 2nd stage heating, and emergency heat.

Whether we're fine-tuning an HVAC system or troubleshooting an issue, understanding each wire's function and connection ensures safe, efficient operations. It's all about connecting the dots to enhance building comfort and efficiency.




Thermostat Wiring
Red
Terminal: R
Connect: 24V AC Power
White
Terminal: W
Connect: Heat
Yellow
Terminal: Y
Connect: Cool (compressor contactor)
Green
Terminal: G
Connect: Indoor Fan
Black
Terminal: C
Connect: 24V AC Common
Orange
Terminal: O
Connect: RV On In Cool
Blue
Terminal: B
Connect: RV On In Heat
Vary
Terminal: Y2
Connect: 2nd Stage Cool
Vary
Terminal: W2
Connect: 2nd Stage Heat
Vary
Terminal: E
Connect: Emergency Heat

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Click Here to Register

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please note this does not include the ABSA exam
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Kenken Puzzle Answer

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

TEST YOUR OPERATOR IQ ANSWERS

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

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TUESDAY NOVEMBER 12, 2024 AT 5PM FOR OUR IN-PERSON MONTHLY MEETING

Title: **Concepts of Cogeneration for Use in Commercial and Light Industrial Applications**

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Presenters: **Adam Fonesca**
Owner & President of Point8 Power Systems
Erik Wathen
Director of Product Support

Location: **Danish Canadian Club, 727 11 Ave SW, Calgary, AB T2R 0E3**

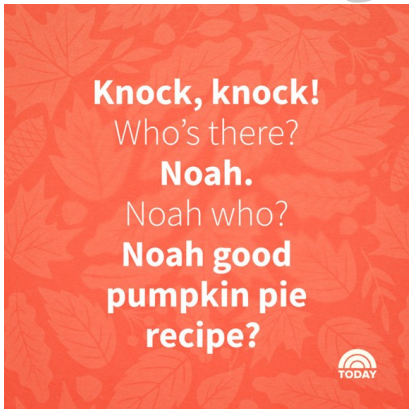
Bio: **Adam is a seasoned power generation subject matter expert (SME) with an educational background in mechanical engineering and electrical engineering technology. Over 15 years of design, construction and maintenance of reciprocating and turbine based power generation equipment.**

Erik is a multidisciplinary power generation subject matter expert (SME) with an educational and practical background as a Heavy Duty Technician, Electrician & factory trained controls expert. Over 20 years of design, construction and maintenance experience with a specific focus on operational excellence. His experience is largely reciprocating engine and switchgear based power generation assets.

Together both presenters will deliver an overview and invite members to engage in dialogue about the subject or other power generation questions and concepts which are often misunderstood.

BOA Building Operators Association of Canada

Just for laughs!



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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 November 12, 2024 @ 5pm

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

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