Volume 31 - Issue 2 – October 2024

BOA
Building Operators Association of Canada

Official Publication of the Building Operators Association (Calgary)

October 2024

What's Inside?

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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Front Cover: Damian Markutt

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.

If you have an opportunity to attend the meetings on the second Tuesday of the month, Mark has arranged some great guest speakers. Andy and Taylor of Merlin Noise control spoke on sound attenuation at the worksite at the September meeting. Mark always has a marvelous well of interesting people to speak at the meetings. Make a point of coming down and meet old friends and meet new ones.

See you at the next meeting, October 8 at the Danish Canadian Club

Les Anderson

BOA Building Operators Association of Canada

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 29*

1. Most low capacity cast iron boilers:

a) Cannot be site assembled
b) Can withstand higher pressures
c) Will pass through standard size doorways
d) Are factory assembled as packaged units
e) Require special foundations

2. Sectional cast iron boiler sections are connected with:

a) Push nipples
b) Modules
c) Victaulic couplings
d) Unions
e) Threaded fittings

3. The steam and water spaces of a cast iron sectional boiler are connected by:

a) Tie rods
b) Tie nipples
c) Hydraulic jacks
d) Steel studs
e) Push nipples

1) 4. Cast iron heating boilers can be classified as:

1. **Push nipple**
2. **Horizontal**
3. **stayed type**
4. **Vertical**
5. **Diagonal**

a) 1, 3
b) 2, 3
c) 1, 2, 5
d) 2, 4, 5
e) 2, 4

5. An advantage of a cast iron boiler would be:

a) Poor corrosion resistance
b) Components are easy to ship
c) Can be easily paid for
d) Capable of high pressures
e) Can easily form steam at low pressures

What Tasks to Look for in Uninterruptible Power Supply Services

UPS (Uninterruptible Power Supply) services involve more comprehensive and extensive tasks compared to regular maintenance. as example the major PM is typically conducted at longer intervals and is aimed at ensuring the UPS's continued performance and reliability over an extended period. Here are the tasks that need to be performed during major maintenance on UPS systems:

1- **Visual Inspection**: Conduct a thorough visual inspection of the UPS system, including its components, wiring, and connections. Look for signs of physical damage, loose connections, or overheating.

2- **Battery Testing**: Test the UPS batteries to assess their health and capacity. This includes checking the voltage, internal resistance, or performing load tests to determine how long the batteries can sustain power during an outage.

3- **Cleaning**: Dust and debris can accumulate inside the UPS, affecting its cooling efficiency and overall performance. Clean the internal components, cooling fans, and air vents to ensure proper ventilation.

4- **Inspection or Replacement of Components**: Inspect and Replace any time-out or faulty components, such as capacitors, fans, or damaged circuit boards. Using genuine replacement parts is

crucial to maintain the UPS's reliability.

5-**Firmware and Software Updates**: Check for any firmware or software updates provided by the UPS manufacturer. Keeping the UPS's firmware up-to-date helps address known issues and improve performance.

6- **Calibration and Adjustment**: Calibrate and adjust the UPS as per the manufacturer's guidelines to ensure accurate function.

7- **Environmental Checks**: Ensure that the UPS is installed in an appropriate environment with proper temperature and humidity levels. Check for any issues that may arise from the operating environment, such as excessive heat or dust.

8- **Load Bank Testing**: For larger UPS systems, perform load bank testing to simulate real-world operating conditions and verify that the UPS can handle its rated load.

9- **Alarm and Log Checks**: Review the UPS system's alarm logs to identify any historical issues or warning messages. Clear any false alarms and address any recurring issues.

10- **Remote Monitoring Configuration**: If the UPS supports remote monitoring capabilities, configure and test the monitoring system to ensure proper communication and alerts.

11- **Review of Operating Parameters**: Check and review the UPS system's operating parameters, such as input and output voltage, frequency, and waveform. Verify that the UPS is within acceptable operating limits.

12- **Documentation and Reporting**: Maintain detailed records of the maintenance activities performed, test results, and any identified issues. These records are useful for future reference and warranty compliance.

13- **UPS Bypass Test**: Test the UPS's bypass functionality to ensure a seamless transfer of power in case of UPS failure or maintenance.

14- **Emergency Shutdown and Restart Tests**: Test the emergency shutdown (EPO) and restart procedures to ensure the UPS can respond appropriately during critical situations.

It is crucial to follow the manufacturer's guidelines and recommendations for major maintenance. This level of maintenance often requires specialized skills and tools, so it's best to have the work performed by trained and qualified UPS service professionals. Major maintenance ensures that the UPS continues to provide reliable backup power and safeguards critical equipment during power outages or disturbances.

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Distributed Energy Resources: Shaping the Future of Energy Supply

Distributed Energy Resources (DERs) are reshaping the global energy landscape with an array of small-scale, decentralized power sources that contribute significantly to the electricity grid. Unlike conventional large-scale power stations, these systems are often located close to the point of electricity consumption, varying from solar panels on residential rooftops to community-based wind turbines and energy storage solutions. The rise of DERs supports the transition towards renewable energy, increased system resilience, and provides consumers with greater control over their energy usage.

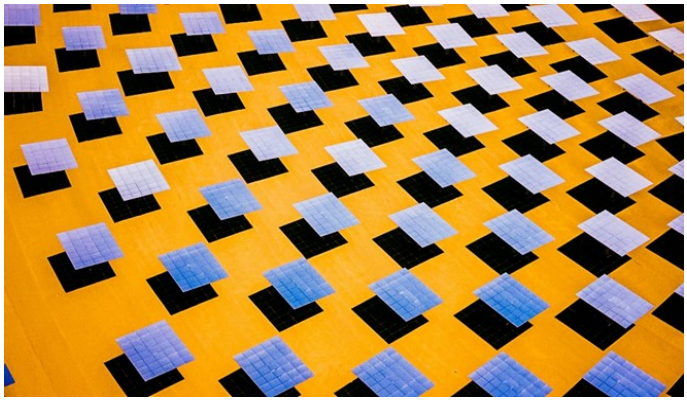
The proliferation of DERs marks a transformative shift in how energy is generated, transmitted, and consumed. This evolution influences not only the physical infrastructure of power grids but also necessitates advancements in regulatory policies and market structures to harmoniously integrate these resources. Technology plays a pivotal role in this transition by facilitating communication between DERs and utilities, ensuring effective grid management, and enabling predictive analytics to balance supply and demand. Collectively, the deployment of DERs heralds a future where energy supply is increasingly clean, distributed, and user centric.

Overview of Distributed Energy Resources

Distributed Energy Resources (DERs) are a paradigm shift in electricity generation and distribution. They signify a move towards decentralized, local production that enhances the resilience and sustainability of energy systems.

Systems

Solar power systems are a cornerstone of DERs, harnessing sunlight to generate electricity. These photovoltaic (PV) systems can range from small, rooftop installations to larger, community-scale arrays. They contribute to grid stability and help in reducing carbon emissions, as exemplified by initiatives like the **Ontario Electricity Grid**'s **integration of locally-owned facilities.**



Wind Turbines

Small-scale wind turbines can serve individual homes or communities, adding to the diversity of DERs. While large-scale wind farms are common, these smaller versions play a growing role in localized energy solutions, particularly in areas with ample wind resources.

Energy Storage Systems

Energy storage systems are pivotal in addressing the intermittency of renewable resources like solar and wind. They store excess energy produced during peak production times for use during demand spikes or lower production periods. Technologies include batteries and flywheel systems, integral in making DERs more reliable.

Combined Heat and Power

Combined Heat and Power (CHP) systems generate electricity and capture usable heat simultaneously.

This efficiency makes CHP a valuable DER, especially in industrial or large residential settings where there is concurrent demand for heat and power.

By utilizing these types of DERs, future energy supply chains are expected to be more distributed, efficient, and environmentally friendly.

Impacts on the Energy Grid

The integration of Distributed Energy Resources (DERs) is set to profoundly reshape the operational dynamics and infrastructure of the energy grid.

Grid Decentralization

The traditional centralized grid model is evolving into a more decentralized network due to the proliferation of DERs. Homes and businesses generating their own power through solar panels or wind turbines contribute to a diversified energy landscape. This decentralization enhances energy security and reliability as the grid becomes less dependent on centralized power plants.

Renewable Integration

Integrating renewables into the grid has become markedly easier with DERs. Systems such as **solar PVs and energy storage** allow for a cleaner energy mix and help to reduce the carbon footprint. With the advancement of technology, these renewable DER systems are not only becoming more efficient but are also increasingly cost-competitive.

Demand Response

DERs play a critical role in demand response initiatives. They provide the grid with the ability to dynamically manage load and adapt to changes in demand in real-time. By leveraging DERs like **smart thermostats and battery storage**, the grid can respond effectively to peak demand periods, thus preventing overloads and increasing overall energy efficiency.

This 18MW microgrid protects operations from utility failures and is paid for by demand response.

Market and Regulatory Considerations

The landscape of Distributed Energy Resources (DERs) is intricately tied to market dynamics and regulatory policies. These considerations dictate the pace of DER adoption and the degree to which they can influence the future energy supply.

Policy and Incentives

Policymakers play a critical role in stimulating the growth of DERs through legislation and incentives. For example, in regions like Ontario, various studies such as the **IESO DER Potential Study** help identify the types and quantities of DERs that could emerge within a decade. The success of DER integration often relies heavily on clear and supportive policies, including financial incentives like subsidies, tax benefits, or feed-in tariffs.

Economic Implications

The integration of DERs impacts the economy by potentially lowering energy costs, providing job opportunities in green industries, and promoting competitive markets. The **Ontario Energy Board's deliberations** on DER impacts explore the need for evolving regulatory approaches to accommodate DERs. These considerations are essential for creating a market environment where DERs can compete fairly, fostering innovation and consumer choice in the energy sector.

Technological Advancements

As the energy landscape evolves, technological advancements in Distributed Energy Resources (DER) are pivotal. They enhance energy efficiency, grid reliability, and pave the way for a sustainable energy future.

Smart Grids

Smart grids represent a significant leap forward in electricity network operations. They utilize advanced communication technologie**s** and automated control systems to optimize energy distribution. Through real-time data acquisition and analysis, smart grids are capable of self-healing during power outages,

dynamically balancing supply and demand, and integrating various forms of renewable energy. These advancements are crucial for adapting to the changing energy supply dynamics brought about by the adoption of DER systems.

Microgrid Developments

Microgrids are localized grids that can disconnect from the traditional grid to operate autonomously. They are often powered by renewable sources like solar and wind, bolstered by energy storage solutions. Technological advancements in microgrid developments include sophisticated management systems that ensure stable operation and seamless transition between grid-connected and island modes. Microgrids exemplify the shift towards more decentralized and resilient energy systems, which are increasingly important in the face of natural disasters and other disruptions to the central grid.

The shift towards Distributed Energy Resources represents a fundamental transformation in how we produce, manage, and consume electricity. This movement towards smaller, localized sources of power not only challenges the traditional centralized model of energy production but also aligns with broader goals of sustainability, resilience, and consumer empowerment. As technology advances, policy adapts, and markets evolve, DERs are set to play a pivotal role in shaping a more efficient, reliable, and green energy landscape.

Embracing this shift requires not just technological innovation but a reimagining of our relationship with energy, underscoring the need for collaborative efforts across sectors to fully realize the potential of distributed energy systems. As we continue to navigate the complexities of integrating DERs into the existing grid, the promise of a more distributed, sustainable, and resilient energy future becomes increasingly tangible, offering a beacon of hope for tackling some of the most pressing environmental challenges of our time

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Life Safety vs. Standby Generators: What Every Facility Manager Needs to Know

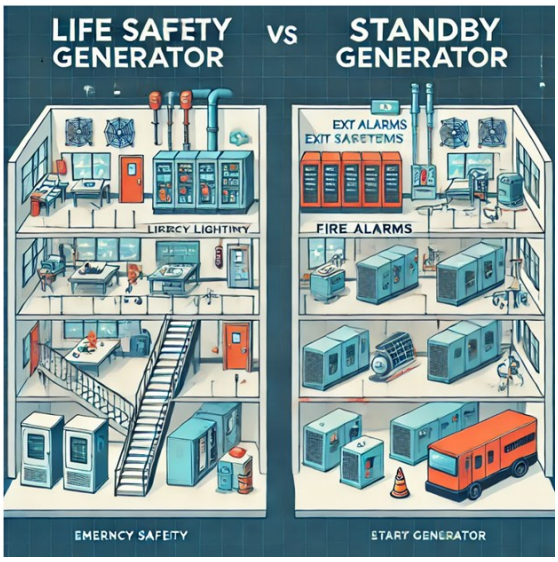
A common question from facility managers that have a generator is whether they have enough capacity with their current generator to add more equipment. Invariably, the first question we have for them is: What is the purpose of your present generator setup? Is it a Life Safety or Standby generator? It is important to understand the difference between the two setups.

The primary difference between a Life Safety generator and a standby generator lies in their intended use and regulatory requirements:

Life Safety Generator:

Purpose: These generators are specifically designed to provide power to critical systems that protect human life in emergency situations, such as hospitals, emergency lighting, fire alarms, and exit signage.

Regulatory Standards: Life Safety generators must comply with strict regulations, such as the **CSA 282: Emergency Electrical Power Supply for Buildings National** in Canada **or the Fire Protection Association (NFPA) 110** in the United States, which mandates performance and installation standards. These generators often need to provide power within 10 seconds of a power outage.



Priority Systems: Power must be provided to life-support systems, fire detection and suppression systems, elevators for evacuation, and other essential emergency services.

Maintenance: These generators require rigorous and frequent testing and maintenance to ensure they are always operational in life-threatening situations.

Standby Generator:

Purpose: Standby generators provide backup power to non-critical systems during power outages. They are often used for residential homes, businesses, or industrial operations to keep essential but non-life-critical equipment running.

Regulatory Standards: Standby generators are typically not subject to the same stringent regulations as life safety generators, though they must still meet local codes and standards for safe operation.

Priority Systems: These generators typically power systems like HVAC, refrigeration, security systems, and other operational needs but are not responsible for critical life-saving equipment.

Activation Time: While many standby generators also activate quickly (within seconds of a power outage), they do not have the 10-second requirement typical of life safety generators.

In summary, **Life Safety generators** are used for critical applications where human lives depend on their immediate and reliable operation, and they are subject to more stringent codes, while **standby generators** are used for backup power in non-critical scenarios.

Do Life Safety and Standby generators feed different panels?

Yes, **Life Safety generators** and **standby generators** typically feed different electrical panels to ensure separation of critical and non-critical loads.

Life Safety Generators:

Dedicated Life Safety Panel: Life safety generators feed a dedicated **life safety panel** that distributes power exclusively to systems essential for protecting human life during an emergency (e.g., emergency lighting, fire alarms, communication systems, elevators for evacuation, and life support systems in healthcare facilities).

Separation Requirement: Codes such as the **CSA282** and **NFPA 110** require that life safety loads be physically and electrically isolated from other loads. This ensures that critical life safety systems are always prioritized and remain functional without interference from non-critical systems.

Standby Generators:

Standby Panel: Standby generators feed a **standby panel** that powers non-life-critical systems such as HVAC, refrigeration, office equipment, or other operational

systems that are important but not essential to human safety.

Less Stringent Requirements: These panels are not subject to the same stringent regulations as life safety panels, though they still follow electrical codes for backup power systems.

Why the Separation?

Priority: Life safety systems must be guaranteed power in emergencies, whereas standby loads are secondary. If there is insufficient generator capacity or a problem arises, life safety loads must not be compromised by non -essential loads.

Compliance: Electrical codes mandate this separation to ensure that life safety systems operate reliably and independently from other systems during an emergency.

This separation of panels ensures that critical systems are prioritized and maintained, providing redundancy and safety during power outages.

Does the CSA282 Emergency electrical power supply for buildings have the same separation requirement as the NFPA 70?

Yes, **CSA 282: Emergency Electrical Power Supply for Buildings** has similar separation requirements as **NFPA 70 (National Electrical Code)**, particularly concerning life safety and non-life safety loads, though there are some distinctions based on regional standards and practices.

Key Similarities:

Separation of Life Safety Loads: Both **CSA 282** and **NFPA 70** require that life safety loads be separated from other types of loads (e.g., standby or optional loads). This ensures that critical systems such as fire alarms, emergency lighting, and life support systems have prioritized access to emergency power during outages.

Dedicated Panels: Both standards stipulate that life safety systems be powered through dedicated electrical panels that are independent of other non-critical systems. This isolation helps ensure that life safety systems are not compromised by faults or overloads in non-critical systems.

Compliance with Local Codes: In both Canada and the U.S., local building and electrical codes may reference CSA 282 or NFPA 70, respectively, requiring compliance with these separation requirements for emergency power installations in specific building types like hospitals, high-rise buildings, and essential service buildings.

Key Differences:

Geographic Application: CSA 282 applies to Canada, while NFPA 70 applies primarily to the U.S., though both share many principles. There might be slight variations in wording or specific applications based on regional practices.

Maintenance Requirements: CSA 282 tends to place a stronger emphasis on routine testing and maintenance practices for emergency power systems, which can indirectly impact how the electrical distribution system, including separation of loads, is managed.

Conclusion:

Both **CSA 282** and **NFPA 70** have the same fundamental requirement of separating life safety and non-life safety loads to ensure reliability and priority for critical systems. The specific implementation may vary slightly depending on regional standards, but the goal of ensuring uninterrupted power to life safety systems remains the same in both standards.

Using a grocery store as an example, what loads would need to be separated between Life Safety and Standby generator panels?

In a **grocery store**, loads would need to be separated between **Life Safety** and **Standby generator** panels based on their importance for protecting human life versus supporting operational needs during an emergency. Here's how the loads typically breakdown:

Life Safety Generator Panel:
This panel would power systems essential for **protecting human life** and ensuring safe evacuation during emergencies, such as:

- **Emergency Lighting**: Exit signs, lighting in emergency exit pathways, stairwells, and building egress points.
- **Fire Alarm Systems**: Fire detection systems, smoke alarms, carbon monoxide detectors, and communication systems connected to fire monitoring stations.
- **Fire Suppression Systems**: Sprinkler pumps and other fire suppression equipment.
- **Elevators (if applicable)**: In larger grocery stores, elevators designated for emergency evacuation purposes must be powered by the life safety generator panel.
- **Emergency Communication Systems**: Systems like public address systems for directing customers and staff during an emergency.

Standby Generator Panel:
This panel powers systems necessary to maintain **operational continuity** during an outage but are not critical for life safety. These typically include:

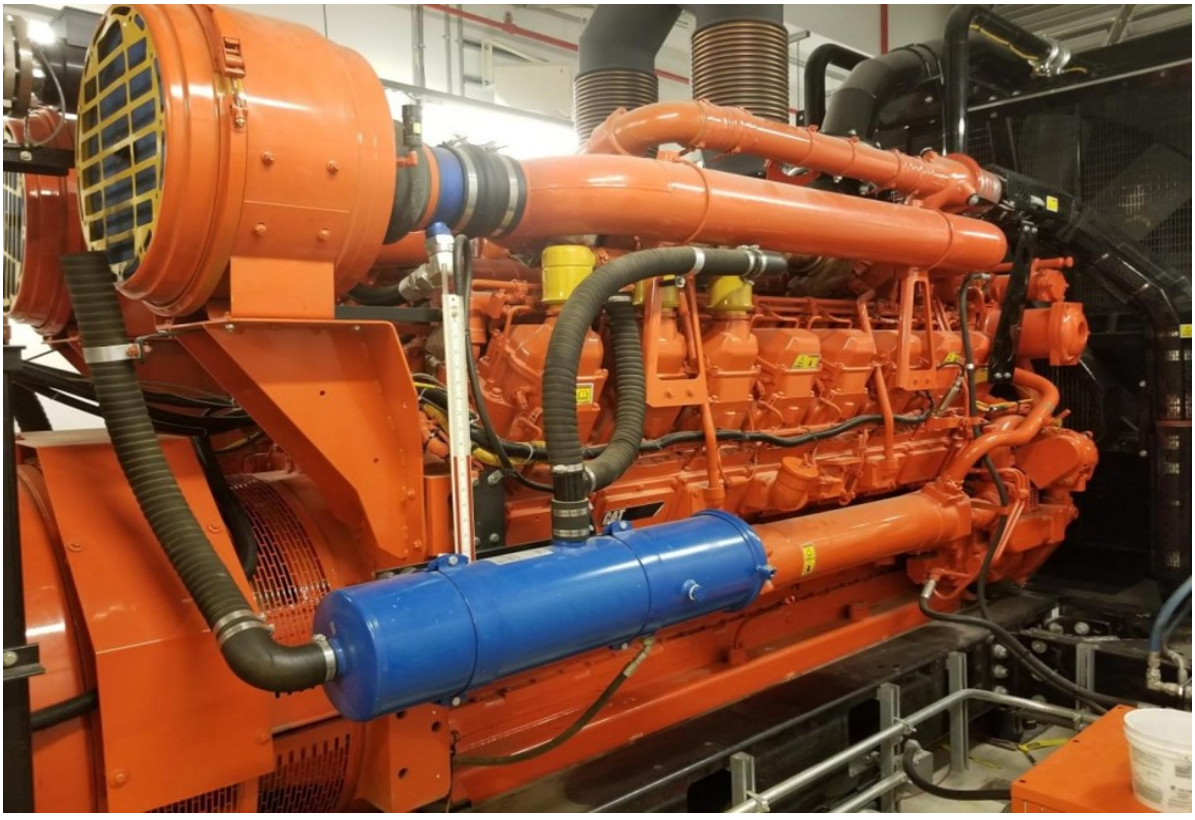
- **Refrigeration Units**: Freezers, refrigerators, and coolers to prevent food spoilage, which is crucial for business operations but not an immediate life safety concern.
- **HVAC Systems**: Heating, ventilation, and air conditioning, unless tied to specific life safety requirements (like maintaining a safe temperature for certain systems).
- **Cash Registers and POS Systems**: Point-of-sale terminals and electronic cash registers to keep the store functioning during a power outage.
- **Security Systems**: Surveillance cameras, security alarms, and access control systems, which are important for maintaining store security but are not critical for immediate life safety.
- **Computers and Communication Networks**: Store management systems, communication equipment, and inventory management tools.

Why Separation Is Important:

- **Life Safety Loads**: Must have the highest priority and comply with regulations that ensure uninterrupted power for safe evacuation and life-protecting measures.
- **Standby Loads**: These loads support operational needs but can tolerate brief delays in power restoration without endangering life.

By separating these systems between the life safety and standby panels, the grocery store ensures that essential life-protecting systems are reliably powered during emergencies, while also maintaining operational continuity where possible.

The distinction between life safety and standby generators is more than just technical jargon—it's about ensuring safety and operational continuity in the face of power outages. Life safety generators are essential for protecting human lives, powering critical systems that must remain operational no matter what. On the other hand, standby generators support non-essential, but still important, systems that keep a facility running smoothly. Before adding more equipment to your generator setup, be sure to evaluate the generator's role and its capacity, and prioritize compliance with life safety codes where required



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KenKen Puzzle

How to solve the Kenken puzzle:

(Answers on page 29)

- 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

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

Restroom Cleaning Revisited

By Alan S. Bigger and Linda B. Bigger

Issues that range from facility image, user access and the bottom line are prompting managers to rethink their cleaning and product-buying strategies.

Too often, managers of housekeeping operations in institutional and commercial facilities make a costly tactical error by downplaying the impact that restrooms can have on a facility's image, as well as on an organization's bottom line.

Facilities of all types are under growing pressure to keep these areas looking their best, despite such challenges as tightening budgets, changing fixtures, and concerns over the use of cleaning chemicals.

Restroom-cleaning kits

Several manufacturers market restroom cleaning kits that include a cleaning cart, bucket and series of extension handles with specialized mop heads and attachments. The cart has space for storage of cleaning supplies and paper products.

Increasingly, microfiber flat mops are replacing traditional cotton string mops. Microfiber mops tend to be easier to use and lighter and can more aggressively clean the surface. Restroom cleaning kits give the cleaner easier access to all necessary products and tools while cleaning.

Some advocates of microfiber cleaning cloths assert that these cloths eliminate or mitigate the need for cleaning chemicals. But the application of appropriate chemicals during the cleaning process can enhance the effective cleaning of restrooms.

Power-assisted cleaning equipment

For several years now, manufacturers have offered specialized power washers for cleaning restrooms. Generally, a power washer is cart-mounted — the cart can carry limited cleaning supplies — and

come in various shapes and sizes.

The machine basically power washes the restroom from ceiling to floor — after the floor has been swept — and air-dries the room before use. These units have specialized chemicals applied through a solution pick-up hose that delivers deep cleaning and surface drying without spots, much like an effective dishwashing agent. More advanced units can power-spray the room, as well as pick up the residue solution after cleaning so the restroom is not out of service too long.

When using these units, operators need to use all safety precautions and protect all paper goods from solution overspray. When used correctly, these units really deep-clean restrooms.

Steam or vapor cleaning

This type of cleaning is growing in popularity. The system does not use chemicals but instead uses a tank that superheats water. It applies steam to the dirty areas through a special wand and an applicator to which the operator can attach cleaning towels. The operator wipes all surfaces with the superheated vapor, changing the cloth as it becomes soiled.

The units also have special heads for crevice cleaning. Besides using these units for cleaning restrooms, crews also can use them cleaning kitchens because steam easily breaks down grease. The units also can be effective for cleaning walls when operators use the wand and towel attachment.

Some manufacturers state that no chemicals are necessary with this type of product, but managers should familiarize themselves with the claims and the infection-control needs of their facilities. Also, operators need to be sure to wear appropriate safety gear because the wand handles can become hot.

Going touchless

Providing equipment — no matter how innovative it might be — will not necessarily solve all restroom -cleaning problems. Restrooms often feature multiple surfaces, including many that users must touch, such as doorknobs, door plates, faucets, soap dispensers, seats, flush valves and towel dispensers. And touching these surfaces creates a need for cleaning.

Using touchless restroom products and systems can minimize the need to clean surfaces, and it can make the department more efficient by giving cleaners more time to clean other surfaces that are more visible such as the sinks, toilet bowls and floors.

By planning prior to the construction or during renovation, managers can integrate the numerous types of touchless restroom technology available today, including these:

- self-flushing toilets and urinals
- auto-on and auto-off faucets
- auto-on and auto-off soap dispensers
- auto-on and auto-off hand dryers
- automatic paper towel dispenser
- entryways with no fixed entrance doors that instead use a maze entry pattern to ensure privacy
- toilet seat covers activated by the touch of a button

Two additional products are becoming increasingly popular in restrooms — waterless urinals that have no plumbing or pipes to cleaning and waterless hand cleaners and sanitizers, which minimize the need for paper towels, soap dispensers and even sinks.

Finally, some restroom systems now combine a hand dryer, a water-dispensing source and a soap dispenser. Users activate the unit by placing their hands into a sink recessed into a wall — note that

there is no need for sink counters. The unit dispenses soap and water, and after the user removes their hands while a built-in hand dryer dries them.

Design also affects a restroom's cleaning demands. Users of modern touchless restrooms enter through a doorless entryway — a maze— use a toilet or urinal that flushes itself, then walk over to a sink with a faucet that turns on and off automatically. They would proceed to the hand dryer or automatic towel dispenser that would activate immediately. Users could leave the facility without touching any fixture or surface.

By using touchless technology, the manager has immediately addressed two concerns of restroom users: the touching of fixtures and the fears of infection. The manager also has made the restroom easier to clean by using such state-of-the-art technology.
By combining advanced cleaning systems with touchless and other innovative technologies — such as waterless urinals and hand cleaners — managers can increase the level of cleanliness in restrooms while controlling costs through greater productivity. The end result is cleaner restrooms that are cleaned more cost effectively while generating fewer customer complaints.

The Image of Restrooms
A flurry of data and polls shed new light on the problem of restroom cleanliness and the impact unclean restrooms can have on workers, hotel guests and students.

According to a survey by the Opinion Research Corp. on school restroom cleanliness, "the problem is so severe that close to 20 percent of the middle and high school students admitted to their parents that they avoid the school restrooms due to dirty and unsafe conditions."

The impact is even more dramatic in the nation's hotels. According to a recent poll of 618 adults, 84 percent of respondents inspected the bathroom and supplies such as toilet paper and facial issues within 15 minutes of entering a hotel room, and 55 percent examined the bathroom immediately after entering a room.

Regardless of facility type, however, restroom cleanliness or its lack — can have huge implications.

The impact can't be understated. Consider this example: An institution of higher learning had received an award for having the best restrooms in the United States. In response, people wrote letters, newspaper and television reporters showed up on the doorsteps of the institution, and the award's announcement even made national news.

The point is that people recognize and appreciate clean restrooms. Indeed, some visitors touring the university campus after the award announcement specifically requested to see the award-winning restrooms.

The importance of the cleanliness of restrooms is critical to both managers and the customers that use their facilities. Maintaining restrooms at the highest state of readiness at the lowest feasible cost is an imperative, since according to survey results, the leading source of complaints in facilities continues to be restroom cleanliness, followed closely behind by concerns about restroom supplies. Customers expect housekeeping managers to keep restrooms clean. Yet many facilities continue to fail in these efforts.

To help managers and their staffs refine restroom cleaning, today's equipment offers a range of products as alternatives to traditional mops, buckets and wringers. Some new systems are incredibly simple, while others are more complex. But most systems enhance the performance of cleaning chemicals — if any chemicals are used at all — and all enable managers to minimize complaints from restroom patrons.

Overcoming Challenges in the Hydrogen Economy

Bill Henderson

The shift towards a hydrogen economy represents a pivotal move in the quest for sustainable energy solutions. However, various obstacles impede its full-scale implementation. Key among these challenges is the costly and energy-intensive production of hydrogen, primarily when it involves splitting water molecules through electrolysis. Moreover, the existing infrastructure for production, storage, and distribution is not yet adequately developed to accommodate hydrogen as a widespread fuel source. These hurdles are substantial, reflecting in the additional challenge of ensuring safety standards, as hydrogen's high flammability demands rigorous safety protocols.

Addressing these challenges requires innovative engineering solutions and significant investment. Engineering institutions and researchers are actively involved in identifying and overcoming these barriers. For instance, at the Engineering Challenges in the Hydrogen Economy 2023, experts convened to discuss the challenges faced by countries around the world and proposed potential solutions. In another example, researchers at the University of Sydney have made strides in better understanding the issue of hydrogen embrittlement, a phenomenon that threatens the integrity of materials used in hydrogen infrastructure.

Collective global efforts spearheaded by energy organizations, government councils, and private sector partners are beginning to shape a viable hydrogen market, despite the complexity and enormity of the challenges. The role of policymakers is also critical, with around 45 countries developing strategies to integrate into their energy mix, aimed at decarbonizing industries and transitioning to a cleaner energy future. These concerted efforts are signs of a committed push towards overcoming the barriers to a hydrogen-based economy.

Current Technical Challenges

The transition to a hydrogen economy is impeded by significant technical challenges, particularly in hydrogen production, energy storage and distribution, and improving fuel cell efficiency while reducing costs

Hydrogen Production

Hydrogen production currently relies heavily on fossil fuels, especially natural gas, resulting in significant carbon emissions. The challenge lies in scaling up green hydrogen production, which uses renewable energy sources to split water into hydrogen and oxygen through a process called electrolysis. This method is costly and requires advancements in electrolyser technology to become competitive with conventional sources.

Energy Storage and Distribution

Hydrogen's low energy density by volume necessitates compression or liquefaction for efficient storage and transport, both energy-intensive processes. Safe and cost-effective energy storage and distribution networks are crucial for a functional hydrogen economy. Additionally, the current infrastructure is built for natural gas and needs substantial modifications to accommodate hydrogen.

Fuel Cell Efficiency and Cost

Fuel cells convert hydrogen into electricity, but their widespread adoption is hindered by high costs and limited durability. Improving fuel cell efficiency while reducing the cost of materials, particularly the catalysts that often contain precious metals, is a critical step. Technological advancements and economies of scale could lead to more affordable and durable fuel cells, a necessary transition for powering vehicles and various energy applications. Many original concepts are popping up daily such as the NamX hydrogen fuel capsule.

Stakeholders Leading the Way

The transition to a global hydrogen economy is being forged by key organizations and institutions with specific roles in the industry, policy-making, and scientific research. They are pivotal in overcoming the technical and economic hurdles by fostering partnerships, enacting supportive policies, and driving innovative research.

Industrial Collaborations

Major companies and industry groups are joining forces to establish standards and scale up hydrogen production infrastructure. For instance, initiatives like Hydrogen Council are pivotal, uniting energy, transport, and industrial companies in a global consortium. Their role is to collaborate in the development of hydrogen technologies and facilitate the commercialization process to enable a widespread hydrogen economy.

Governmental Policies and Support

Governments play a critical role through the implementation

of policies that incentivize clean energy technologies. This includes direct funding for hydrogen projects and legislative support for renewable energy sources. Public-private partnerships, like those fostered by the European Commission's hydrogen strategy, demonstrate the commitment to integrating hydrogen as a cornerstone of future energy systems, providing a mix of regulatory support and financial incentives.

Research and Development Efforts

Research institutions and universities around the world are propelling the scientific progress necessary to make hydrogen a viable alternative to fossil fuels. They're focusing on solving efficiency barriers and reducing costs. The development of advanced electrolysis techniques is an example of such efforts, aimed at enhancing hydrogen production from sustainable energy sources.

Despite the significant challenges that lie ahead, the global commitment to overcoming these barriers is stronger than ever. With engineering minds converging to solve the pressing issues of hydrogen production, storage, and distribution, and with governments and industries alike rallying behind the cause, the vision of a hydrogen economy is slowly but surely becoming a reality. As we continue to push the boundaries of what's possible, the dream of a sustainable, clean energy future powered by green hydrogen is not just a possibility—it's within our grasp, promising a brighter, cleaner world for generations to come.

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10 FUN FACTS ABOUT HALLOWEEN

1. The original Jack-O-Lanterns were made from turnips, not pumpkins!
2. It is believed that Halloween originated in Ireland.
3. The Haunted Cave haunted house in Ohio is the longest. It is 3,564 ft. long and 80 ft. below ground.
4. According to the National Retail Federation, in 2018, Halloween spending totaled roughly 9 billion.
5. Samhainophobia is the fear of Halloween.
6. Nearly 9 billion pieces of candy corn were produced in 2016, according to the National Confectioners Association.
7. Harry Houdini died on Halloween in 1926 from a ruptured appendix.
8. More than twice as much chocolate is sold for Halloween as for Valentine's Day.
9. The last time there was a full moon on Halloween was on October 31, 2001. The next one will not occur until October 31, 2020.
10. In the UK, white cats are considered bad luck whereas in the US, it's black cats that are considered bad luck.

TRICK or TREAT

BOO!

Strategies that aim to keep Plumbing Systems Flowing

Maintenance and repair of a facility's numerous plumbing system components is especially important because according to health and safety codes, buildings must not be occupied without Functional plumbing.

Plumbing systems are constantly in operation, maintaining

pressure, temperature and water seals between the occupied spaces and the septic or sewage disposal system.

Starting a plumbing maintenance program

The first step in beginning a maintenance program is a complete audit of the various systems and a count of all fixtures and plumbing apparatus, such as pumps, water heaters, pressure regulators and filters.

A set of the building's plumbing plans and specifications is helpful to have, as are operating and maintenance manuals, valve tag charts, parts lists and manufacturers' cuts. All of these materials are usually readily available from the architect or the plumbing contractor for a recently constructed building.

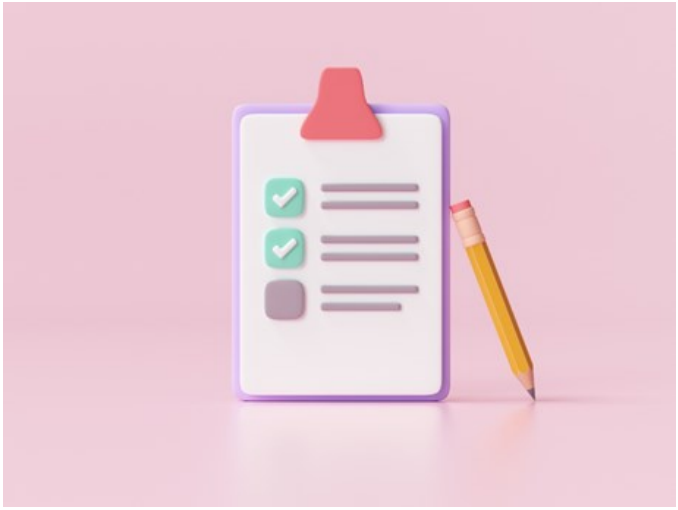
Part of initiating the maintenance program is to make decisions pertaining to service, such as how much will be performed in-house and how much will be contracted out to a plumbing contractor or professional service organization. It is imperative that these decisions be made before an emergency arises.

Emergencies such as broken water pipes, backed up drains, gas leaks, and lack of hot water have to be addressed immediately. As with HVAC equipment, when plumbing emergencies occur during non-work hours, telephone numbers should be available so custodians or security personnel can contact building maintenance people.

Maintenance managers then will have decide how best to respond. The goal of any response will be to have all systems functioning as soon as possible without disrupting facility operations.

Preparing a maintenance log

A log should be kept of all plumbing fixtures, appliances and ancillary equipment. The log should indicate the age and condition of each item, as well as its history of operation and repair. It also should list any spare parts, along with their



location.

In larger facilities, rather than log each individual plumbing fixture, a log page can suffice for each toilet room, as it can in the case of a motel/hotel or nursing home, individual or patient rooms.

If the plumbing systems contain pumps or shell and heat tube exchangers, keep records showing inlet and outlet pressure and temperature readings. Changes in these readings might indicate air accumulation in the lines or the need to punch tubes in the exchanger coil. Also record the electrical current drawn by the pump motor.

The log can be used as a checklist, as well as a repair record for the various items, noting those requiring excessive repair. From this, a proper maintenance schedule can be determined.

Equipment inspections

The simplest form of inspection of plumbing systems is observing the daily use of the equipment and its reliability. Questions to be answered during inspection include the following:

- Are adequate water pressure and temperature being maintained?
- Is the design or set water temperature being maintained?
- Do all faucets or flush valves close completely, or do they continue to drip or dribble after closure?
- Do any fixtures show discoloration? This may rust or other water borne minerals, as well as the need for a water treatment or filtration program.
- Are any of the fixtures' drains noisy or slower to empty that what is desirable? This might indicate that fixture traps need to be emptied or cleared out, or perhaps a more aggressive action is necessary. A chemical drain cleaner can break up clumps of hair or other forms of build-up inside traps or on the interior walls of the drainage piping system. Using any chemical cleaner can be hazardous, so follow manufacturer's directions strictly.
- Are odors present? Check for dry trap seals in floor drains or fixtures.
- Does exposed pipe coverings or insulation appear moist, indicating a possible leak or condensation?

In addition to the daily "inspection by use" of these systems and fixtures, janitorial crews should be alerted to notify maintenance personnel of any perceived malfunctions.

During a heavy rainstorm, observe area drains for slow operation, indicated by a backup of standing water or water cascading from the roof down the exterior walls, roof hatches or into ducts serving exhaust fans or other rooftop HVAC equipment.

Check screens or strainers on roof and areas drains periodically for blockage.

Continual occurrences of any of the above should alert the maintenance department to the possibility of a defect in the system design or a malfunction of a mechanical device within the system.

Common repair items

The most frequently needed plumbing repairs typically involve flushometers on water closets and urinals and seals on faucets or other water outlets.

The need for repairs is identified by routine inspections or in the course of daily use of plumbing fixtures by the building's occupants. If the cleaning crew is part of the facility's in-house maintenance department, they are a good source of information on any problems and needed repairs.

Some modifications required by the Americans with Disabilities Act also may be included in the repair upgrade category. Major remodeling of rest rooms, hallways, for example, may be categorized as capital improvements, but smaller adaptations of such as pipe covering insulation may be considered maintenance and repair items.

Unlike HVAC and fire protection, plumbing maintenance generally does not involve regularly scheduled maintenance procedures. Instead, it relies chiefly on regular inspections to reveal problems or potential problems. The observations of building users and the cleaning crew are also a primary source of information as to fixture condition.

An effective reporting and response system prevents minor maintenance issues from developing into long-term nuisances or costly major repairs, thereby protecting the maintenance department and its reputation.

Specialized Systems

Certain specialized plumbing systems in some facilities may require additional attention in terms of maintenance and inspection. These include:

- Hospitals, which have medical gas systems carrying oxygen, vacuum, nitrogen, nitrous oxygen and compressed air. Hospitals and laboratories also have acid waste systems, bed pan washers, autopsy tables and therapeutic baths.
- Schools, gymnasiums, athletic facilities, and hotels/motels, which have specialized swimming pool and filtration systems.
- Restaurants and other food preparation facilities, which use various plumbing systems to serve dish, utensil and tray washers; pot washers; coffee urns; ice makers; and refrigerators.
- Dental offices, which require cup sinks and vacuum and compressed air.

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The Critical Role of Power Supply Maintenance and Backup Systems in Data Centres: A Global Perspective

As the leading facility manager, I've seen firsthand the crucial importance of robust power supply maintenance and effective backup systems in data centres. In today's highly interconnected and digital world, data centres are the backbone of countless businesses, industries, and services. Ensuring continuous operation is vital, and at the heart of this continuity is the power supply system. In this article, we will explore why maintaining these systems is paramount, the significance of backup solutions, and how adherence to ISO standards enhances reliability and performance.

The Lifeblood of Data Centres: Power Supply Systems

Data centres rely on a stable and uninterrupted flow of electricity. Even a brief power outage can result in data loss, service disruption, and costly downtime. As the facility manager, ensuring the availability of power is a non-negotiable responsibility, and this entails regular maintenance, proactive risk management, and strategic foresight.

The power supply in a data centre isn't a simple grid connection. It's a complex system involving multiple components, such as uninterruptible power supplies (UPS), generators, automatic transfer switches (ATS), and battery systems. Each of these components needs careful oversight and maintenance to function optimally. Preventive maintenance is essential, as any component failure can compromise the entire system.

Key Components and Maintenance Requirements:

- **UPS Systems:** These provide instant backup power during outages, allowing the data centre to transition to backup generators seamlessly. Regularly testing and replacing UPS batteries and ensuring the UPS system's capacity matches the facility's demand, is crucial. Insufficient or poorly maintained UPS systems can lead to disastrous power interruptions.
- **Generators:** These take over during extended outages. Testing them under load, checking fuel levels, and ensuring that automatic start mechanisms are functioning properly are essential tasks for a facility manager. Ensuring the generators can handle the facility's full load is non-negotiable.

Switchgear and Transformers: Switchgear isolates faults, and transformers convert high voltage to usable levels within the data centre. Routine inspection and maintenance of these systems ensure that any issues are caught before they become critical failures.

The Necessity of Backup Systems

Even with well-maintained power systems, there is always the potential for failure. This is where backup systems come into play. Backup power solutions in data centres are not merely contingency plans; they are integral to the facility's operation and are designed to ensure that in the event of a primary power failure, business continuity is maintained.

Types of Backup Systems:

1. **Battery Backup (UPS):** Typically the first line of defence, UPS systems maintain power flow during short-term outages and while backup generators are coming online.

2. **Diesel or Gas Generators:** For longer outages, generators provide power until the main grid is restored. In data centres, they must be capable of handling the entire load of the facility without failure.
3. **Redundant Power Grids:** Some high-tier data centres have connections to multiple power grids, ensuring that if one grid fails, another can take over.

Having redundant power sources and backup systems in place is critical for avoiding single points of failure. A Tier IV data centre, for instance, requires complete fault tolerance, meaning that maintenance activities or equipment failures on any part of the power supply chain do not affect the operations.

Compliance with ISO Standards

As facility managers, adhering to internationally recognised standards like ISO helps to ensure the reliability, safety, and efficiency of power systems. Two key ISO standards are particularly relevant when considering power supply and backup systems in data centres:

1. SO 50001:2018 - Energy Management Systems ISO 50001 provides a framework for establishing, implementing, and maintaining energy management systems. In the context of data centres, following ISO 50001 enables facility managers to optimise energy use, reduce costs, and ensure the sustainability of power supply systems. By implementing this standard, we can ensure that our power systems are not only reliable but also energy efficient, reducing the facility's carbon footprint and operating costs.

2. ISO/IEC 27001:2022 - Information Security Management Systems Although traditionally associated with cybersecurity, ISO 27001 also covers the physical security and availability of IT systems, including the power supply. It recognises that protecting information goes beyond firewalls and antivirus software. The physical infrastructure, such as UPS systems and backup generators, is equally critical in ensuring data availability. Compliance with ISO 27001 helps to mitigate the risks associated with power outages, including data loss and service interruptions.

3. ISO/IEC 30134-2:2016 - Data Centres - Key Performance Indicators (KPIs) for Energy Efficiency This ISO standard focuses specifically on the energy efficiency of data centres, providing guidance on how to measure and optimise energy use. By adhering to this standard, facility managers can ensure that power systems are not only reliable but also cost-effective. Regular maintenance and optimisation of power systems in line with ISO 30134-2 can reduce the Power Usage Effectiveness (PUE) of the facility, a key performance metric in data centre operations

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

TEST YOUR OPERATOR IQ ANSWERS

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

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An overview of typical door & hardware scenarios and challenges encountered in commercial and residential buildings.

Presenter: **Jeff Wilson Service Sales, Creative Door**

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

Bio: Jeff has spent the last six years as a commercial service rep and operations manager with Creative Door. He has been in the door industry for 15 years. His experience spans pedestrian, automatic, overhead specialty doors.

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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 October 8, 2024 @ 5pm

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

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