
Smart Emergency Lighting

Relief for healthcare facilities
or unnecessary tech?

Introduction

“A building is classified safe when all emergency lights within it are fully operational. Shockingly, about 80% of buildings worldwide do not meet this requirement.”

Healthcare facilities managers are under pressure.

To remain compliant, they must prioritize safety despite aging infrastructure and escalating costs.

Combine the pressure of a global pandemic and an on-going workforce shortage, and healthcare facilities across America face a perfect storm.

Turning to better technology to ease the burden for facility managers seems logical, but it's far from a simple decision.

Healthcare facilities managers must carefully consider and plan for the impact of upgrading technology on maintaining regulatory obligations and the needs of the building's vulnerable and often non-ambulatory occupants. Combine these concerns with the sheer complexity of healthcare facilities versus other kinds of buildings, and the task can feel daunting for even the most experienced managers.

Will smart building technology provide building managers with relief around these challenges, or is it simply another piece of technology to worry about?

This article explores the unique and complex environment within which healthcare facilities operate and the role smart emergency lighting technology trends may play in the future.



Table of contents

4	Current challenges
8	Trends in emergency lighting that could make a difference
12	Innovation's impact on healthcare facilities
14	Conclusion



— Current Challenges

Regulation and compliance

The safety of occupants is the primary concern of all facilities managers, and in the United States, the majority of healthcare facilities opt for accreditation, above and beyond the state inspections required for Medicare reimbursement (i).

With research suggesting a positive link between accreditation and patient outcomes (ii), compliance and accreditation has become a crucial consideration for healthcare facilities managers.

As a result, America's healthcare sector has some of the strictest requirements for emergency lighting in the world.

Even for smaller facilities, it takes up a sizable portion of time and operation budget to uphold these codes, and for larger structures, it's a continuous challenge.

State and federal codes like Article 700 or 701 of the National Electric Code, National Fire Protection Association (NFPA) Code 70, NFPA 101 Life Safety Code, and the NFPA 1 Fire Code and IBC (International Building Code) Chapter 10.

The Centers for Medicare & Medicaid Services (CMS) Emergency Preparedness Requirements mandate health care providers that participate in Medicare and Medicaid to have an emergency plan, conduct training and testing, and have emergency lighting.

The Joint Commission requires that hospitals comply with relevant laws, regulations, building and fire safety codes and facility inspection requirements which includes emergency lighting systems that must be monitored, tested and documented regularly.

Complexity of operations

It's hard to compare a healthcare facility to other kinds of structures due to its complexity.

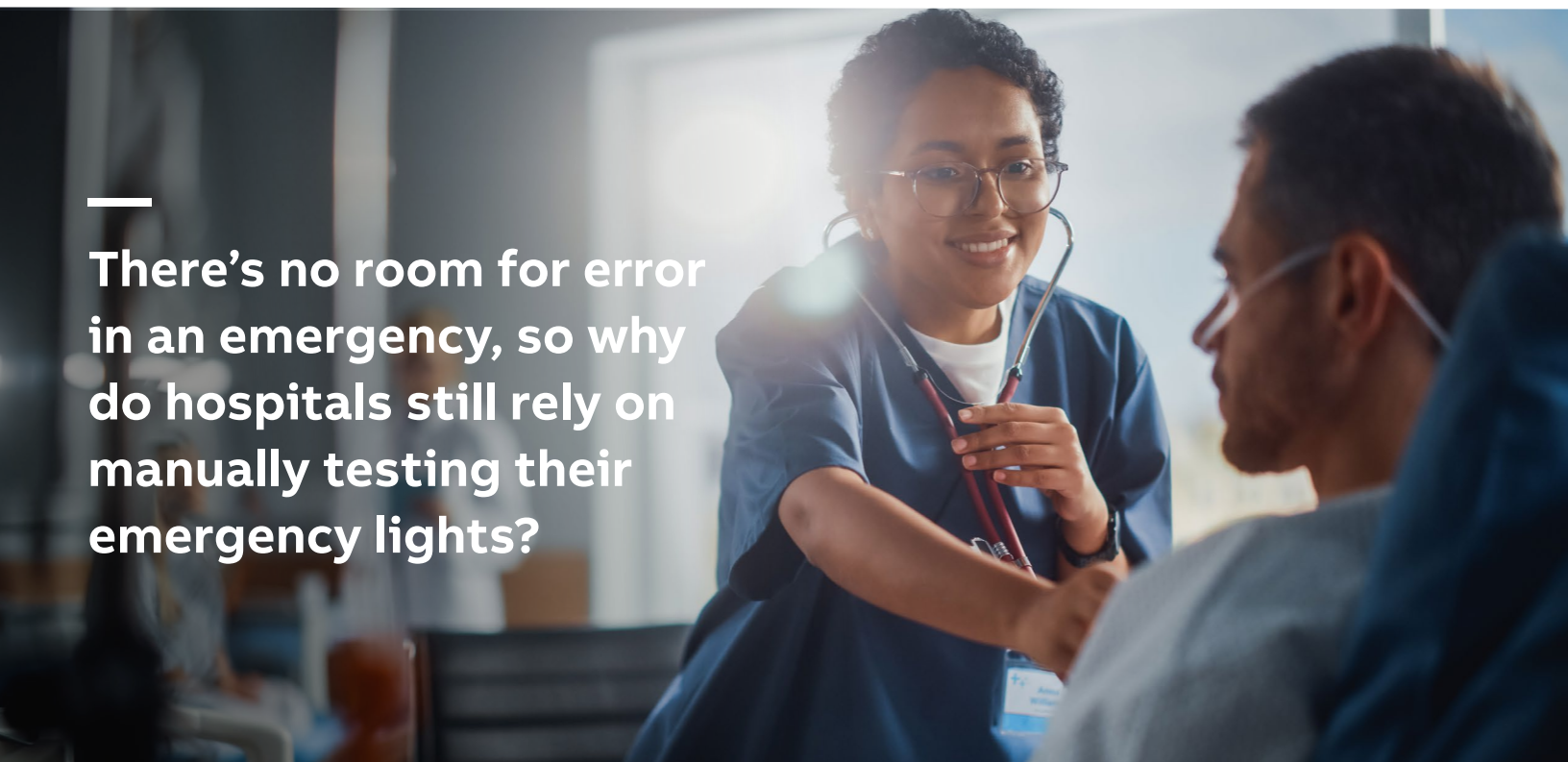
When we think about installing and maintaining emergency lighting units, many will envision a large warehouse or manufacturing facility where technicians can walk down the aisles and see everything in the open, but these buildings don't exist in healthcare.

In contrast, a single hospital may consist of hundreds of rooms, hallways, floors, and outbuildings. This means that a manual emergency lighting system inspection could involve thousands of fixtures to be individually monitored,

tested and accurately logged. Factor in medical office buildings, often scattered across a region, and managers must also consider travel liability and the ever-increasing costs of transportation.

The complexity of manually maintaining emergency lighting in a healthcare facility is costly, labor-intensive and time-consuming. It diverts valuable human resources and expenditures away from other high-priority projects, and for managers, it can seem that, by the time they've refined and staffed for their process, the regulations change yet again.

There's no room for error in an emergency, so why do hospitals still rely on manually testing their emergency lights?



Sensitivity of occupants

The vulnerability of occupants presents a challenge around regular maintenance of emergency lighting systems.

To ensure that scheduled tests are done on time, personnel may be required to enter critical care and restricted areas (like an operating room) to inspect and test equipment.

Given the unique nature of a medical facility, there may be times when maintenance engineers are not able to enter an area at all, creating longer intervals of testing and potentially putting occupants and accreditation at risk.

At the other extreme, there may be times, like during the Covid-19 pandemic, when personnel have to enter high-risk areas to test emergency lights, and then move through the entire facility, potentially spreading infection to patients and healthcare workers alike.

It's no wonder that many health care facilities managers often find themselves facing difficult decisions with far-reaching implications.





Trends in emergency lighting
that could make a difference.

The emergence of Mini-Inverters

The introduction of Mini-Inverters to the emergency lighting industry in recent years has caused quite a stir in healthcare facilities.

WHAT ARE THEY?

Emergency lighting is a critical life safety installation that has unique load characteristics and requires specialized back up power systems.

Mini-Inverters provide that backup power for emergency lighting systems in a power failure and allow existing fixtures to be used as emergency lighting.

WHAT PROBLEM DO THEY SOLVE?

Mini-Inverters provide a streamlined emergency lighting system with a small footprint.

Each Mini-Inverter can power many existing lighting fixtures yet be stored unobtrusively in a small space (electrical closet) on each floor of a facility.

A single Mini-Inverter can supply an entire building depending on the size and fixture load.

Because Mini-Inverters run existing light fixtures in a power failure, they preserve the aesthetics of high-visibility areas.

Mini-Inverters act as an ideal choice for rooms that contain a variety of emergency lights that need to be tested regularly with specific requirements that are graded for specialized rooms like an operating room. These kinds of lights are both expensive and difficult to replace, given the challenge of finding graded emergency lighting fixtures with these characteristics.

DOWNSIDES

Healthcare facilities tend to operate a myriad of lighting systems, some highly specialized like surgical lighting. Some of these lighting fixtures need to be derated often resulting in the mini-inverter losing its load efficiency.

Installation can be daunting, and due to electrical wiring complexity in aging facilities, some facility managers may choose to select single point units over mini-inverters, even when Mini-Inverters would be the best choice to keep existing specialized fixtures.

IoT connectivity

When it comes to emergency lighting systems, the Internet of Things is a game-changer.

Imagine an emergency light that can tell you if it's working or not without you having to ask.

WHAT IS IT?

A connected system of emergency lights and exit signs spread across a facility or multiples

facilities that can store and communicate data to personnel via a centralized server.

WHAT PROBLEM DOES IT SOLVE?

Smart lighting solutions may reduce emergency lighting maintenance costs up to 90%.

The centralized server allows facilities to reduce personnel requirements from many to few, inoculating facilities from labor shortages.

Emergency lights can be tested simultaneously at the touch of a button.

Emergency lighting fixtures can be grouped to allow managers to test certain lights at times that do not interfere with hospital or medical center operations.

Rather than blanket-surveys and time spent manually investigating the possibility of malfunctions, maintenance engineers can be immediately directed to areas that need attention.

Real time reporting and access to centralized data logs allows facilities managers to fulfill regulatory obligations and strategically target maintenance budgets.

Automated testing and reporting reduces the margin of error that plagues manual testing.

Smart lighting allows for timed and logical functions, system supervision, and remote programming.

DOWNSIDES

When building from the ground up, including smart emergency lighting systems makes sense, but when it comes to retrofitting aging buildings, not all facility managers have the knowledge to approach smart building systems.

Smart emergency lighting systems, like exit signs, tend to run on LED lights. Unlike fluorescent lamps that, when they get to the end of their life, suddenly go off, LED lights slowly fade over time to the point that there's hardly any light.

Centralized control systems that use IoT to automate testing could report these fixtures as 'working' when in fact, they are barely working, and certainly not as bright as needed.

Too many standalone systems that don't share a common user-interface can become heavy for personnel to manage.

Although this new technology is promising, it may also present challenges and issues that developers did not anticipate. The need to de-bug even the most innovative technology is a reality.

Adapting to new technologies presents a learning curve regarding operations and manipulation, and can create a larger margin of error in the initial phase.

User-friendly Experience

We live in an age where the touch of a smartphone screen can dim the lights, play music and open a chat with family across the country. For healthcare facilities managers, user-friendly applications with intuitive interfaces are transforming the entire function from arduous to intuitive.

WHAT IS IT?

Healthcare facilities managers can easily monitor, test and control smart emergency lighting systems in real time using a

computer, laptop or even a mobile device like smart phone or tablet.

WHAT PROBLEM DOES IT SOLVE?

Unprecedented flexibility around location.

These applications can provide maintenance logs and generate compliance reports at the touch of a button.

Healthcare facilities managers can easily manage installations and component removal.

24-7 Monitoring means managers receive real-time alerts when fixtures require attention.

Easy to use grouping functionality allows managers to strategically create, save and edit groups for batch testing.

DOWNSIDES

Simplifying the User-friendly Experience for emergency lighting applications could make it easy for those not fully trained in the software to believe they can use it effectively. With so much at risk, organizations that invest in smart building solutions are well-advised to ensure that only fully trained personnel operate the system.

To date, no centralized operating software exists that's agnostic with all emergency lighting systems. This means that, when upgrading a facility, managers must consider

how to select smart systems that integrates with other systems or Building Management systems and create a long-term ecosystem that facilitates operation.

Not all systems integrate, and standalone systems still require consideration.

How a solution is determined matters. Not all healthcare facility managers are familiar with emergency lighting systems, so it's necessary to rely on experts to find long term solutions that go beyond a simple product sale.



—
Innovation's impact
on healthcare facilities.



This healthcare industry is growing. Global health care spending is projected to increase at an annual rate of 4.1%, up from just 1.3%.¹

As healthcare providers seek innovative, cost-effective ways to reduce the pressure on personnel and financial resources in health trusts, choosing smart building technology can play a critical role in everything from HVAC and power distribution to in-room control and emergency management.

Lighting technology in particular plays a role in the cost structure of hospital maintenance given the countless number of lighting points within patient rooms, research facilities, hallways, waiting rooms, laboratories and lobbies – all requiring lighting that best serves their purpose.

We can also look to wider motivators for the acceleration of this technology.

From 2020 to 2022, the Covid-19 pandemic highlighted weaknesses around relying exclusively on personnel. This is compounded by the existing labor shortage that makes it difficult to obtain the specialized expertise needed to manually maintain emergency lighting systems in healthcare facilities.

Smart lighting systems are but one branch of IoT technology that's revolutionizing how we design and manage healthcare facilities around the world.

¹. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-hc-outlook-2018.pdf>



Conclusion.



Visit the online sales page of any systems manufacturer, and the acceleration of smart building technology becomes evident.

Of course, every form of technology carries its own challenges, and humans are, by our very nature, resistant to change. But when it comes to emergency lighting systems, healthcare facilities managers have much to gain by taking the time to understand these advances.

Making the transition to the myriad of smart technology options available will offer managers a significant return on their investment with regard to maintaining compliance and accreditation, strategic resourcing and, most importantly, ensuring the safety of all occupants should the unthinkable occur.

I. <https://jamanetwork.com/journals/jama/fullarticle/2718782>

II. <https://pubmed.ncbi.nlm.nih.gov/12674428/>



Let's write the future. Together.

Who We Are

ABB is a global leader in technology solutions with over 105,000 employees from 100 different countries around the world.

For the past 130 years, ABB and its predecessors have worked to build sustainable, innovative solutions, and push the boundaries of tech to shape new business models – and find new ways of working that benefit everyone.

What We Do

A healthy building is the best partner for medical staff and patients' healing process.

That's why ABB offers complete, integrated and flexible solutions for hospitals, nursing or retirement homes and clinics. We aim to ensure safe and reliable operations, system uptime, and meet capacity demand. This way, you have full system visibility and actionable insights to help you maximize performance and safety.

30+

Healthcare solution products to fit your clinics needs.

130 Year-Long

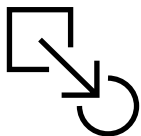
History of excellence.

105,000

Talented employees in over 100 countries.

21 Divisions

in Electrification, Motion, Process Automation and Robotics & Discrete Automation.



Flexibility

Change the function of the spaces without major reconstruction or investment to face sanitary challenges.



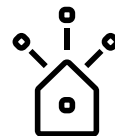
Sustainability

Reduce carbon footprint of healthcare operations and achieve green or LEED's certification.



Wellbeing

Improve indoor environment quality for medical staff and daily occupier like patients and relatives.



Efficiency

Autonomously optimize energy operating with the least amount of electricity ensuring continuous operations.

Primary services within health care industry.

Power Distribution

Lighting Control

Emergency Lighting

In-Room Control

HVAC Control

Electric Vehicle Charging

Motor & Variable Speed Drives

Energy Management

Get in touch today: ABB Healthcare / ABB Electrification Canada ULC

1811 Boulevard Hymus, Dorval, Québec, Canada, H9P 1J5

Technical & Customer Support 1-800-435-7365