Preventing unattended alarms leading to a crisis

Kevin Brown, managing director at BlueSky Wireless, and ICON's Richard Salvage, highlight 'the potentially catastrophic consequences' of unattended alarms in healthcare. Here they explore why messaging, automation, and monitoring are crucial factors in mitigating risk.

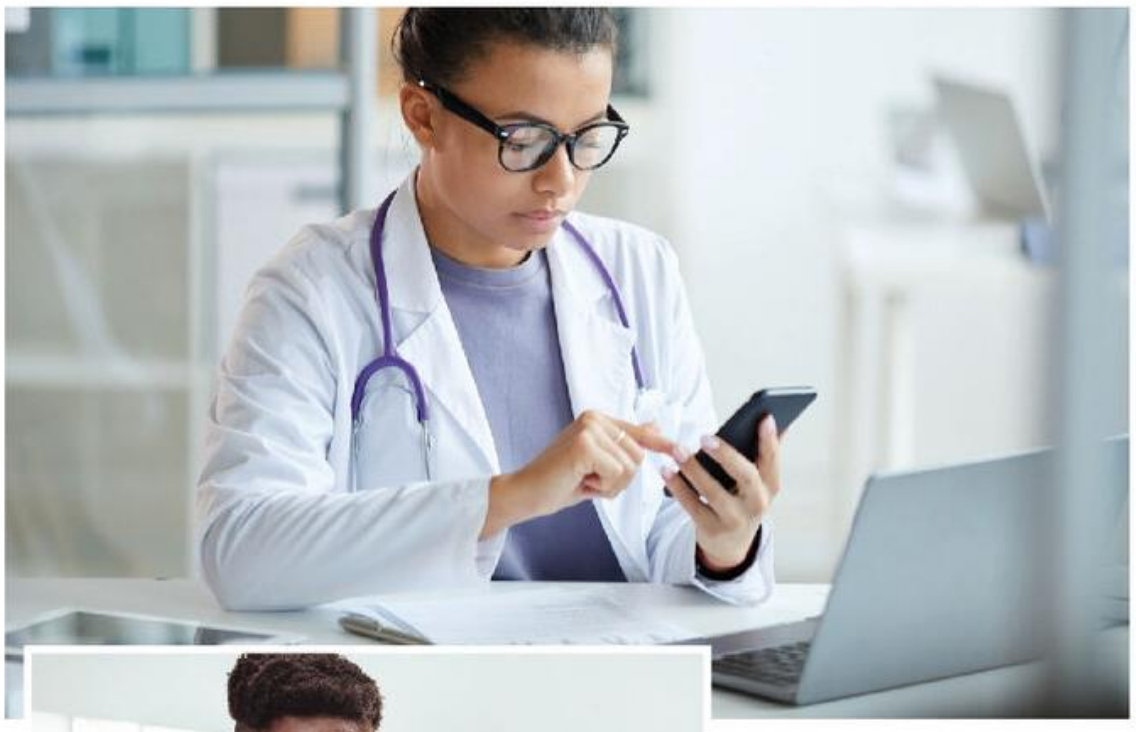
In the high-stakes environment of UK hospitals, where every second counts, the role of a Building Management System (BMS) cannot be overstated. This sophisticated network of interconnected systems ensures the safety, health, and operational efficiency of hospital facilities. When these systems function correctly, they provide the backbone for seamless healthcare delivery. However, when they fail – especially when alarms go unattended – the consequences can be severe, and even life-threatening.

The essence of a BMS lies in its ability to monitor and control various critical building functions, ranging from heating, ventilation, and air-conditioning (HVAC) systems to power supplies, medical gas systems, and fire safety protocols. The BMS generates alarms whenever an anomaly or failure occurs. These alarms can indicate anything from a minor inconvenience, like a non-critical system warning, to a dire emergency – such as a power outage in a critical care unit, where patients depend on life support systems. Ignoring or delaying the response to these alarms can lead to catastrophic outcomes, not only risking patient lives, but also threatening the hospital's operational continuity and financial stability.

The traditional approach – a manual process rife with risks

Despite the vital importance of these alarms, many hospitals continue to rely on outdated and manual processes to manage them. Traditionally, alarms generated by the BMS are displayed in a colour-coded list on a PC monitor located in the hospital's switchboard room. Here, operators are tasked with the dual responsibility of answering calls and monitoring these alarms. This set-up places a significant burden on operators, who must continuously scan the monitor for new alerts while juggling other responsibilities. The potential for human error in such a system is high, as operators might overlook or delay the recognition of a critical alarm due to the sheer volume of tasks they manage.

Once an operator identifies a high-priority alert, the process of notifying the appropriate personnel begins. This typically involves making a phone call to the relevant individual or team, passing on a message that may contain minimal information due to the operator's limited understanding of the situation. If the primary contact cannot be reached, the procedure dictates that the operator reviews the escalation protocol to find the next suitable recipient. This method is not only time-consuming, but also fraught with the potential for miscommunication, delays, and, in some cases, complete failure to notify the necessary personnel.



One of the standout features of the BlueSky Messaging System is its versatility in delivering messages. This flexibility is particularly important in hospital environments, where staff members are constantly on the move.

The manual process of alarm management is inherently flawed. It relies heavily on the vigilance and efficiency of human operators, who are prone to fatigue and distraction. In busy hospital environments, where the volume of incoming calls and alarms can be overwhelming, the likelihood of an alarm being missed or inadequately addressed increases significantly. Furthermore, the manual process lacks the ability to provide real-time, detailed information about the nature of the alarm, leaving responders with little context to act swiftly and appropriately.

In scenarios where time is of the essence – such as during a fire alarm or a power failure in a critical care unit – every second of delay in response can escalate the situation from manageable to disastrous. The absence of automated, reliable systems to manage these alarms not

By integrating the Smart Console into the BlueSky platform, hospitals can improve overall safety and operational efficiency, the authors say.

only compromises patient safety, but can also potentially expose the hospital to legal liabilities, financial penalties, and reputational damage.

Recognising the critical need for a more efficient and reliable alarm management system, the BlueSky Messaging System introduces a revolutionary approach that automates the dispatching of messages, ensuring that no alert goes unnoticed or unattended. BlueSky's system replicates the traditional colour-coded alarm display, while significantly enhancing it with real-time monitoring and automated notifications. This integration not only streamlines the process, but also drastically reduces the margin for error.

Real-time monitoring and automatic dispatching

BlueSky's system is designed to take the burden off human operators by automatically dispatching alarms to the relevant personnel as soon as they occur. This automation ensures that critical alerts are communicated instantly, eliminating the delays inherent in manual processes. Operators still have access to a comprehensive view of all active alarms, but they no longer need to manually track and notify recipients. Instead, they can focus on verifying that the correct individuals have been informed and, if necessary, take further action.

The automation process involves pre-defining individuals, groups, and escalation routes for each alarm type and severity level. When an alarm is triggered, the system automatically sends a message to the designated recipients. These messages can vary in complexity depending on the source of the alarm. For instance, a fire alarm might include detailed information such as 'Smoke detector triggered in room 138', while a simpler alert, such as a duct flow sensor, might simply state 'No Flow in Duct 43'. The clarity and specificity of these messages enable responders to assess the situation quickly and accurately, leading to more effective interventions.

One of the standout features of the BlueSky Messaging System is its versatility in delivering messages. The system supports a wide range of endpoints, ensuring that the alert reaches the recipient no matter where they are, or what device they are using. Messages can be sent to pagers, radios, DECT handsets, Wi-Fi handsets, smartphones, and even specialised healthcare devices like the Spectralink Versity handset. This flexibility is particularly important in hospital environments, where staff members are constantly on the move, and may not always be near a fixed station.

BlueSky's system also includes a fail-safe mechanism to ensure that messages are delivered. If an initial text message fails to reach the recipient, the system will attempt multiple deliveries. Additionally, the optional 'Escalation Module' adds another layer of security by providing an option to escalate a message through a series of steps to contact other team members or managers if no response is received to a message.

To further assist responders, BlueSky offers an optional Mapping Module that provides a visual representation of the alarm's location. This feature is particularly useful for new, temporary, or agency staff who may not be familiar with the hospital's layout. When an alarm is triggered, the Mapping Module can automatically display a map showing the precise location of the incident. If the message recipient requires additional information, they can contact the switchboard, where operators can provide further assistance using the map.

When emergencies force your switchboard to relocate or rely on remote workers, the ability to receive BMS alarms is often compromised. With BlueSky's redundant servers, alarms are automatically distributed to the right people, regardless of the switchboard's location.

Even if relocated, an operator can easily display a master list of current alarms on any computer.

From legacy devices to 'cutting-edge' 4D radar

In hospitals, plant and infrastructure aren't just conveniences; they're critical for safety and care continuity. Many older devices, despite lacking modern connectivity, require constant monitoring. BlueSky can integrate and monitor a wide range of devices – from medical gas alarms to basic relays, ensuring site safety through automated alerts.

At the other end of the spectrum, BlueSky interfaces with advanced technologies like Vayyar's 4D radar, a transformative fall detection system. Unlike traditional methods, this ceiling-mounted sensor monitors patients without wearable devices or cameras, protecting privacy, while providing 24/7 real-time alerts to healthcare staff. Vayyar's radar not only detects falls, but also analyses movement patterns, helping to prevent falls before they happen. This proactive approach improves patient outcomes, reduces hospital stays, and lowers costs, making it a vital tool for ensuring safety across hospital environments.

While automation handles most of the alarm management, BlueSky also empowers operators with tools to monitor the status of message deliveries. Should an event escalate or require manual intervention, operators can activate the BlueSky IncidentTraxx module. This advanced digital incident management system guides operators through the appropriate response procedures

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BlueSky's Mortuary Monitoring module 'provides accurate temperature alerting, helping hospitals avoid breaches of HTA regulations'.

based on the type of incident. By centralising and digitising incident management, IncidentTraxx enhances situational awareness, reduces response times, and ensures that all relevant personnel have access to crucial information during emergencies.

The BlueSky system not only improves the speed and accuracy of alarm responses, but also enhances overall safety and operational efficiency within the hospital. By ensuring that critical alerts reach the right personnel swiftly, BlueSky helps to minimise response times, reduce the risk of adverse outcomes, and avoid financial penalties associated with delayed or missed alarms.

In the event of a major emergency, such as a natural disaster or a terror threat, hospitals may be forced to relocate their switchboard operations or rely on remote workers. In such scenarios, traditional alarm systems often fail to function effectively, as they are typically tied to a fixed location. This can lead to a complete loss of the ability to receive and respond to BMS alarms, putting the hospital at significant risk.

BlueSky addresses this vulnerability by incorporating multiple redundant servers into its system. This redundancy ensures that alarms continue to be distributed to the right personnel automatically, regardless of the switchboard's physical location. Operators can easily access a master list of current alarms from any computer, even if the switchboard has been relocated. This capability is crucial for maintaining business continuity and ensuring that critical operations are not disrupted during emergencies.

Ensuring compliance and traceability

In the modern healthcare environment, compliance with regulatory standards and the ability to provide traceable audit trails are essential. This is particularly true for organisations like the Human Tissue Authority (HTA), where stringent guidelines govern the handling and storage of human tissues. BlueSky's system is designed with compliance in mind, providing detailed logs and audit trails for every alert generated. Each log entry records the message content, type, time, date, and delivery details, ensuring that hospitals have a comprehensive record of all alarm-related activities. These logs are retained indefinitely, depending on hardware configuration, providing a valuable resource for both internal reviews and regulatory audits.

The ability to provide traceable, time-stamped records of alarm responses not only supports compliance efforts, but also enhances accountability and transparency within the hospital. In the event of an investigation or audit, hospitals can rely on BlueSky's logs to demonstrate that appropriate actions were taken in response to alarms, thereby mitigating potential legal and regulatory risks.

Beyond alarms – specialised healthcare modules

BlueSky is not just an alarm management system; it is a comprehensive platform designed to meet the specific needs of healthcare environments. In addition to its core messaging services, BlueSky offers a range of specialised healthcare modules that integrate seamlessly into the system, providing additional functionality tailored to the unique demands of hospital operations.

In a hospital setting, staff safety is paramount, especially in situations where personnel may be working alone or in potentially dangerous conditions. BlueSky's Personal Safety module integrates with devices like Spectralink DECT, Wi-Fi, and smartphones, which are equipped with alarm buttons and sensors. These devices can trigger alarms through the BlueSky system, alerting a predefined group of users when assistance is required.

Advanced models, such as the Spectralink Versity, are specifically designed for healthcare environments, featuring rugged exteriors, durable Gorilla Glass, and shift-replaceable batteries. These devices are also fully waterproof, making them suitable for use in a variety of healthcare settings. BlueSky Alarm Interface Modules further enhance safety by ensuring that alerts generated by these devices are quickly and reliably communicated to the right personnel. Wall-mounted panic strips and buttons can also be integrated into the BlueSky system, providing additional layers of security in areas where staff may need immediate assistance.

SoloTraxx – monitoring lone workers

Lone worker safety is a significant concern in hospitals, where staff may find themselves working alone in remote areas of the facility. BlueSky's SoloTraxx platform is designed to monitor these workers using a variety of technologies. The platform can conduct mandatory response checks, monitor tilt sensors and accelerometers, and respond to alarm buttons. If an event occurs – such as a fall or a missed response check – the system automatically sends an alert to a predefined individual, group, or escalation route. This ensures that lone workers receive prompt assistance in the event of an emergency, reducing the risk of injury or worse.

Richard Salvage

Richard Salvage is the National Sales manager for ICON distribution. With over 20 years' service at ICON, he has a wealth of experience in healthcare, hospitality, and industry, providing wireless data and wireless voice solutions, including Wi-Fi infrastructure, Professional DECT, Voice over Wi-Fi, and cellular technology. The latest addition to the wireless product range leverages the wireless knowledge of the ICON sales and technical team with 60 GHz 4D radar fall detection for the infirm and elderly. ICON works with many telecom and healthcare partners to provide on-site communication, messaging, and lone worker and staff attack systems in complex environments. Real-time, private, clear communication is imperative to promoting patient and staff safety, and enhancing efficiency and productivity in sites such as hospitals, care homes, nursing homes, and hospices. Complex sites such as mental healthcare facilities, youth custody centres, and children's safe care units, can also benefit from accurate location capability.

Kevin Brown

Kevin Brown is the CEO and co-founder of BlueSky Wireless. With a career that began in 1989 in embedded system design and software engineering, he quickly advanced into leadership roles, where he successfully brought products and services to market. In 2003, he co-founded BlueSky Wireless with two colleagues, and has been at the company's helm ever since. Under his leadership, BlueSky Wireless has become a leader in integrated communication solutions, serving industries such as healthcare, manufacturing, hospitality, retail, and education.

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To prevent false alarms, the system can also send a check message to the recipient before escalating the alert. This feature helps to ensure that genuine emergencies are prioritised while minimising unnecessary disruptions.

RouteTraxx – ensuring security patrols

Security is another critical aspect of hospital operations, particularly in large facilities with complex layouts. BlueSky's RouteTraxx technology provides a state-of-the-art solution for monitoring security personnel as they conduct their patrols. By using geo-tagged QR checkpoints, the system tracks the exact routes taken by security teams, ensuring that they adhere to their designated paths. The RouteTraxx web app allows for real-time monitoring of patrol routes, providing supervisors with a clear view of security operations at any given time. Furthermore, users can also report incidents which call for help dealing with patients or somebody from Estates to repair a broken door for example. This real-time insight enhances the efficiency and effectiveness of security personnel, ensuring that potential threats are identified and addressed promptly.

IncidentTraxx – managing critical threats

In the event of a critical threat, such as a fire or a terrorist incident, the ability to manage the situation effectively can make all the difference. BlueSky's IncidentTraxx module is specifically designed to handle these high-stakes scenarios. This advanced incident management system digitises and centralises the management process, allowing for real-time monitoring, decision-making, and communication.

IncidentTraxx streamlines the response to critical threats by providing a structured framework that reduces response times and minimises the risk of errors. The module also enhances situational awareness by ensuring that all relevant personnel have access to up-to-date information, and can coordinate their efforts effectively. In line with Martyn's Law, which mandates discreet staff communication during terror events, IncidentTraxx ensures compliance by facilitating secure and controlled communication channels and audit trail.

Mortuary monitoring – ensuring compliance with HTA regulations

Maintaining the proper temperature in mortuaries is essential for compliance with Human Tissue Authority (HTA) regulations. Temperature deviations can lead to the degradation of stored tissues and bodies, resulting in severe consequences, including loss of accreditation, legal action, and emotional distress for bereaved families.

BlueSky's Mortuary Monitoring module provides accurate temperature alerting, helping hospitals avoid breaches of HTA regulations. The system ensures that any temperature deviations are detected and addressed promptly, safeguarding the integrity of stored tissues, and maintaining compliance with regulatory standards.

Smart Console – enhancing communication and safety

The Smart Console module is another innovative feature of the BlueSky platform, providing an advanced communication platform for mass notifications. This module offers a reliable alternative to traditional hospital pager systems, which can be slow and cumbersome. The Smart Console delivers instant voice or text alerts across multiple channels, ensuring that critical information reaches all relevant personnel without delay.

This enhanced communication capability supports real-time decision-making, particularly in emergency situations, where speed and accuracy are paramount. By integrating the Smart Console into the BlueSky platform, hospitals can improve overall safety and operational efficiency, ensuring that staff are informed and coordinated in the event of an emergency. In addition, Smart Console is fully portable, and can easily be relocated to another location.

The integration of advanced alarm management systems like BlueSky represents a significant step forward in hospital safety and operational efficiency. By automating the dispatch of alarms, providing real-time monitoring, and offering a range of specialised healthcare modules, BlueSky addresses the critical challenges faced by hospitals in managing their Building Management Systems.

In an environment where every second counts, BlueSky's ability to ensure that alarms are promptly and accurately communicated to the right personnel can be the difference between life and death. Beyond enhancing safety, the system also supports compliance, strengthens business continuity, and provides a comprehensive platform for managing a wide range of hospital operations. As hospitals continue to evolve and adopt new technologies, systems like BlueSky will play an increasingly important role in ensuring that healthcare facilities can meet the demands of modern patient care while maintaining the highest standards of safety and efficiency. **HEJ**

Advanced personal safety devices, such as the Spectralink Versity, here being used by a clinician wearing latex gloves, are specifically designed for healthcare environments, featuring rugged exteriors, durable Gorilla Glass, and shift-replaceable batteries.