Hospital Environmental Monitoring: Compliant & Continuous

Hazel Hawkins Memorial is a full service, not-for-profit hospital located in Hollister, CA. Founded in 1907, the hospital offers a full range of inpatient and outpatient services including: emergency services, stroke care, surgical services, radiology and diagnostic imaging services, laboratory services, palliative care, physical, speech and occupational therapy, respiratory care, and a birthing center.

Frank Gee manages the facilities for the hospital's main campus in Hollister and 15 outpatient clinics throughout San Benito County. In his role as the Director of Plant Operations and Engineering responsible for all facility maintenance operations, Mr. Gee oversees adherence to safety and engineering standards and compliance with applicable regulations, laws, and codes.

In 2018 The Joint Commission (TJC), a US-based accrediting body that establishes and enforces standards to ensure the safety and quality of healthcare facilities, performed a site survey of Hazel Hawkins.

Survey findings

"At the time, we were using manual methods to record temperature and humidity conditions," says Mr. Gee. "The survey showed that this created gaps in the records of environmental conditions. The results of this particular survey focused on the relative humidity of our surgical suites, which include two operating rooms (ORs) in the main hospital and three in our Ambulatory Surgery Center (ASC). Hazel Hawkins' ORs do not run 24/7; they are often closed on weekends and at night. With minimal staffing in the surgical suites to write down continuous data, conditions were not always recorded. TJC wanted to see the humidity in the ORs and sterile rooms monitored continuously and unconditionally."

Relative humidity must be controlled in ORs and sterile rooms to mitigate the growth of microorganisms, prevent electrostatic discharge (ESD), and ensure ideal working conditions for OR personnel. Humidity can affect sterile supplies and electro-medical devices in ORs.

"The relative humidity can never go beyond 60% because the risk of infection increases," says Mr. Gee. "Even during a procedure, surgeons are compelled to consider discontinuing that procedure if the relative humidity goes beyond 60%. In addition, modern surgery can include robotics and other devices that can be negatively affected by electrostatic discharge if the relative humidity goes below 30%."

At the survey, TJC surveyors issued an "Accreditation Survey Findings Report". The report contained Requirements for Improvement (RFI) on monitoring humidity in the surgical suites, temperatures for drug storage refrigerators, and temperatures for blanket warmers. When a hospital receives survey findings, it must respond by submitting an Evidence of Standards Compliance (ESC) Report for each RFI.

The standards cited from TJC publication "Evidence of Standards Compliance" (ESC) included:

- EC.02.05.01 – 15: In critical care areas designed to control airborne contaminants (such as biological agents, gases, fumes, dust), the ventilation system provides appropriate pressure relationships, air-exchange rates, filtration efficiencies, temperature and humidity. Note: For more information about areas designed for control of airborne contaminants, the basis for design compliance is the Guidelines for Design and Construction of Health Care Facilities, based on the edition used at the time of design (if available).

- ESC: MM.03.01.01 – 2: The hospital stores medications according to the manufacturer's recommendations or, in the absence of such recommendations, according to a pharmacist's instructions. Note: This element of performance is also applicable to sample medications.

An in-house continuous monitoring implementation team of hospital managers was created to respond to the RFI. "The challenge was that we needed to take immediate corrective actions and submit our report within 90 days," says Mr. Gee. "So we were under some significant time constraints."

Searching for a solution

While researching monitoring systems, the team at first looked in-house. "We talked to our IT team member and he recommended some wired data loggers that IT uses to monitor temperature and humidity in their equipment closets. We tried them, but the data loggers were giving inconsistent values. With a tight timeline to implement the system in response to the survey, we had lost valuable time trying to use less proficient data loggers."

Hazel Hawkins' team then looked to another leading provider of environmental monitoring systems. "The other system had a lower price," says Mr. Gee. "This system is often used in HVAC and building automation systems and we knew they had full capabilities like technical service and a good network of service providers. They are a well-known system vendor.

"But, we were interested in viewLinc's ability to easily combine all the parameters we needed, i.e., relative humidity, temperature, and differential pressure. With a single monitoring system, we wouldn't have to buy different systems and software. So long as the system implementation could be completed in time, we were confident viewLinc would meet our needs.

"We requested references from other hospitals already using the viewLinc system. One hospital facility manager provided as a reference said, 'We swear by the viewLinc system…'. He recommended Vaisala's wireless system to save on the time and cost of running wires for data logger communication. With that advice we decided to go with Vaisala's VaiNet wireless data loggers.

"I have never known a Vaisala sensor to fail; at high altitudes or in low temperatures. If the Air Force relies on this product for weather applications, it's a reliable product."

Frank Gee
Hazel Hawkins Memorial

A flexible, continuous monitoring solution

There were several features that made the viewLinc system advantageous at Hazel Hawkins. "First we needed the system to be fully operational quickly," says Mr. Gee. "We needed accurate and reliable measurements. There were several applications where a continuous monitoring system would be useful to us. For example, along with humidity and temperatures, we can monitor positive air pressure in the surgical suites and temperatures in pharmaceutical refrigerators.

"We are happy not to need different systems to monitor relative humidity, refrigerated temperatures, and differential pressure," says Mr. Gee. Hazel Hawkins also installed Vaisala's CAB100 Industrial Cabinet to integrate differential pressure monitoring with viewLinc.

"We now use viewLinc to monitor all our critical environmental parameters. We have viewLinc displays set up in all our surgical suites and on essential staff computers, so that the current conditions are visible to all staff."

Follow-up survey success

The speed of system implementation was crucial because of the 90-day deadline. "Our Vaisala sales manager promised to keep us up-to-date on the progress of the device shipment. The system was installed with the help of Vaisala Field Service. When a TJC surveyor returned, we presented him with printouts of viewLinc records for the dates and times of his choosing. In addition, we were able to show him on a tablet that he could run viewLinc reports from any monitored location, for any date,

and any time period. The surveyor was impressed and the ESC for that RFI was accepted by TJC.

"During the implementation team's decision-making process to select a new monitoring system, which was time-critical, our Vaisala sales manager was here almost every day and able to address all our concerns. He even let us try out the system for over a week to let us see its capabilities for ourselves. Buying a monitoring system for a critical environment is similar to buying a luxury car. At first you can only look at the sticker price, but after you test drive it – you're sold!"

CAB100 Industrial Cabinet shown with PDT101 for monitoring differential pressure.

VaiNet Wireless Temperature & Humidity Data Logger RFL100

VaiNet Wireless Temperature Data Logger RFL100 with optional dual probe

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