

HEADS UP...

TOPIC: Managing Risks Associated with Utility Systems

SETTING: Hospital Accreditation Program (HAP)

Why is this important?

Heating, ventilation, and air-conditioning (HVAC) systems maintain the building environment within a desired range, providing year-round control of building temperatures, humidity, airflow (pressures), air exchange rates, and filtration. HVAC systems are very important not only in preserving patient comfort and safety, but also in minimizing the spread of airborne infectious contaminants, which is especially important in critical care and surgical areas. Despite the recognized importance of high-performing HVAC systems, surveyors continue to find issues with pressure relationships, temperature, humidity, as well as non-compliance with inspection, testing, and maintenance of HVAC systems on survey.

Scope of the Problem:

Time period: **January 1, 2019 through March 31, 2020**

Number of full surveys performed: **1664**

Number of high and moderate risk findings related to management of risks associated with utility systems (EC.02.05.01 EP 15): **374 (23%) ***

*10% of findings in the highest risk categories

Observations identified within a specific topic area may reveal systemic areas of improvement across the organization which might be reflected in additional standards/EPs within the Environment of Care or Life Safety Code chapter management chapter and/or other chapters/standards/EPs: See also EC.02.05.05 EP 4 & 5; EC.02.05.05 EP 5; §482.25(b)(1), §482.42

Sample survey observations [from surveyor notes] and contributing factors

- The temperature and humidity were not being monitored after hours and on weekends in OR sterile supply storage where large volumes of sterile supplies are kept.
- The air pressure to the compounding room for non-hazardous sterile medication compounding was neutral to the adjoining room.
- Pressure relationships between contamination and clean rooms was not negative, as required.
- The organization adopted the categorical waiver for humidity levels below 30% but had not conducted an assessment for equipment and supplies to ensure safety and efficacy.
- During the Building Tour it was discovered that OR #5 had temperatures above the required temperatures as identified on the daily Temp-log sheet for two days. The FGI Guidelines, 2010 Edition, requires 68 to 73 degrees Fahrenheit; however, the temperatures were in the range between 74.3 to 75.2. There was no documentation of corrective action or follow up.

Potential contributing factors:

- Improperly functioning equipment (exhaust and/or HVAC systems; upgrades to system needed).
- Inadequate monitoring
- Leadership failed to ensure that the assigned staff who had oversight of the air pressure compliance program followed through with the staff responsible for collecting and managing the data.
- Manual manipulation of individual thermostats to accommodate other staff requests (e.g. surgeons in the OR).
- Inadequate staff training and education re: correct monitoring and logging, correlation of HVAC systems to safety, role and plan of action if readings out of compliance.
- Inadequate staff training on CMS requirement when adopting waivers.

How to identify potential problems in your organization

Review your policies and procedures

- Does the organization have a process to ensure that the HVAC system provide appropriate pressure relationships, air-exchange rates, filtration efficiencies and temperature and humidity?
- Does the organization do routine HVAC test and balancing to provide baselines for air-exchange rates and pressure relationships?
- Has the organization established a minimal relative humidity range for equipment, products, sterile supplies, and minimizing infections?
- Does the organization have defined activities to inspect, test and maintain the utility systems (or use an external service to do so)?
- Is all the HVAC system equipment included in a computerized maintenance management system that utilizes proper OEM or AEM maintenance strategies?

Interview staff (engineering, OR staff, OB staff, etc.)

- Can staff demonstrate an understanding of the following regarding HVAC and utility systems:
 - The requirements for pressure relationships, air-exchange rates, temperature and humidity readings and documentation thereof?
 - How are temperature and humidity levels maintained? Are they at the required levels in accordance with the hospital policy and evidence-based guidelines? Who is responsible for tracking and maintenance and the process for addressing out of compliance? How often is temperature and humidity levels documented and where?
 - How do you test and monitor negative/positive pressure relationship between the airborne infectious isolation rooms, operating rooms, sterile storage, medication rooms, and other sterile areas and the adjacent areas??
 - Familiarity with the technology utilized to eliminate/minimize and to assist with responding to an incident (alarms, humidity, pressure or temperatures out of range, settings for min/max).
 - Knowledge of how technology is maintained, who is responsible for maintaining the technology, and what to do if the technology fails.
 - Knowledge of tracking and/or documentation logs, including how to respond when an incident occurs (pressure relationships, air-exchange rates, filtration efficiencies, temperature, and humidity vary from the appropriate HVAC settings)? Who is authorized to conduct a shutdown?
 - Process for temporarily lowering or exceeding the design guidelines for a temporary excursion to facilitate patient care or outcome according to the organization's policy (for temperature only).
- Are staff knowledgeable about instructions for use (IFU) requirements regarding humidity levels for existing inventory of supplies and equipment used in critical areas (e.g. the OR)?
- Is someone at the organization familiar with the CMS S&C memo noting expectations (for deemed status).

Assess your environment

- Are required frequencies for maintaining, inspecting, and testing of utility system components completed in accordance with manufacturer recommendations (appropriate documentation available)?
- If using a CMS category waiver (which allows for humidity levels to be between 20% and 60%), has the organization completed the required risk assessment to ensure that supplies and equipment can be used and stored at these humidity levels?

Evaluate implementation

- Review documentation logs of temp and humidity readings, including on weekends; ensure scheduled maintenance activities have a 100% completion rate.
- Test air-exchange rates, temperature and humidity readings in both critical and non-critical areas (non-critical could be a soiled room in med/surg).

What are some resources that can assist in mitigating risks in these areas?

- The Joint Commission, physical environment resources: <https://www.jointcommission.org/en/resources/patient-safety-topics/the-physical-environment/utility-systems/> and Environment of Care News, August 2014. *The role of HVAC systems in preserving patient safety.*
- Guidelines for Design and Construction of Health Care Facilities: <https://fgiguideines.org/guidelines/2018-fgi-guidelines/>
- National Fire Protection Agency (NFPA) 99-2012, which includes 2008 ASHRAE 170, or state design requirements if more stringent. <https://catalog.nfpa.org/NFPA-99-Health-Care-Facilities-Code-2012-Edition-P16523.aspx>