Physical Environment Portal: Module 1, EC.02.05.01 Leadership

Utility System Definition

From the HAP Glossary: Building systems that provide support to the environment of care, including electrical distribution and emergency power; vertical and horizontal transport; heating, ventilating, and air conditioning (HVAC); plumbing, boiler, and steam; refrigeration; piped gases; vacuum systems; and fire alarm and suppression systems; and communication systems, including data exchange systems.

In this document:

1. Leadership Orientation
    a. Survey Finding
2. Design and Installation of Utility Systems (EC.02.05.01 EP 1)
    a. Survey Finding
3. Ventilation, air filtration and air changes in critical areas (EC.02.05.01 EP 15)
    a. Utility System Definition
    b. Non-compliance: Ventilation
    c. What is Ventilation
4. Practical Test
5. During Survey
    a. Analogy
6. Evaluation of Compliance
    a. Evaluating the Utility System: Design & Installation (EP1)
    b. Evaluating the Utility System: Air Filtration and Air Changes in Critical Care Areas (EP 15)
    c. Evaluating the Utility System: Shutdown Procedures for Utility Systems (EP 9)

Leadership Orientation

It is beneficial for Leadership to have a basic understanding of the utility systems at an outcome level. There is no need to understand how to operate the equipment/system/features, but leadership should understand the impact if the specific equipment/system/features failed.

Working with the Facilities team through tours and discussion leadership could develop a basic understanding. The following are suggested discussion points:

1. Starting with the Joint Commission required Management Plans, ask questions related to compliance and the utility systems
2. Next, the Joint Commission requires monitoring of these utility systems, so asking questions related to
    a. what is measured
    b. how the various equipment, system and features are monitored
    c. what are acceptable outcomes.

Survey Finding: A survey finding at EC.02.05.01 EP 1 and 15 will result in CLD Status

A survey finding at EC.02.05.01 EP 1 (COP §482.42 (A-0747)) and EP 15 (COP §482.41 (A-0700)) will result in a Condition Level Deficiency (CLD), which also results in a Medicare Deficiency Follow-up Survey within 45 calendar days of the final survey report being published. This follow up survey will focus on the survey issues, but may also address any other non-compliant conditions identified at this time.

Design and Installation of Utility Systems (EC.02.05.01 EP 1)

Design includes the features of the utility systems that support patient care. For example, if Lab bought new equipment and did not include facilities in the planning, and then finds that the power supply is not adequate for the equipment would be an example of lack of design.

Compliance includes improperly installed systems. For example, improperly installed equipment for heating that results in patient dis-satisfaction (patients often complain they are cold, as evidenced by the high use of additional blankets in the patient care rooms). The Joint Commission expects utility systems to be fully commissioned following installation, to ensure the outcome is consistent with the needed utility system. EC.02.05.05 EP 1 also requires the organization to test utility system components before initial use, and after major repairs or upgrades.

Survey Finding: A survey finding at EC.02.05.01 EP 9 is related to business continuity

A survey finding at EC.02.05.01 EP 9 is related to business continuity where appropriate labeling of utility systems to complete partial or complete utility system shutdown. For example, loss of a boiler in Minnesota in the winter may interrupt patient care delivery. Safely shutting down the failing heating system (boiler) will prevent extreme damage (i.e. boiler explosion). This finding is written when the specific shutdown procedures are not available. It is important to insure that the effects of a utility system disruption are communicated to the areas affected, that clinical staff have ready-practiced procedures to implement if a disruption affects patient care, and that there is a proactive plan to obtain needed repair services.

Ventilation, air filtration and air changes in critical areas (EC.02.05.01 EP 15)

Text Box: Utility System Definition

From the HAP Glossary: Building systems that provide support to the environment of care, including electrical distribution and emergency power; vertical and horizontal transport; heating, ventilating, and air conditioning (HVAC); plumbing, boiler, and steam; refrigeration; piped gases; vacuum systems; and fire alarm and suppression systems; and communication systems, including data exchange systems.

Non-compliance: Ventilation

Non-compliance occurs when the ventilation system is unable to provide appropriate pressure relationships, air-exchange rates and filtration efficiencies. Specific areas lack negative or positive pressures in relationship to adjacent areas, such as an Operating Room (required to be positive to adjacent areas). Also, in the Operating Rooms if there are an incorrect number of air changes per hour non-compliance results. Critical areas designed for control of airborne contaminants include spaces such as operating rooms, special procedure rooms (procedures that require a sterile field), airborne infection isolation rooms or procedure rooms with patients having pulmonary or laryngeal conditions, protective environment rooms, laboratory and pharmacy spaces where tasks are performed requiring air quality

management (add-mixing, chemotherapy preparation, microbiology, etc.), and sterile processing and supply rooms.

What is Ventilation?

Ventilation is moving air from one location to another. This includes bringing in air from the outside (supply air) and removing air from the inside (exhaust or return air).

Supply Air is taking air from the outside, which is conditioned by cooling or heating as the air moves through a series of coils in an air handling unit. To save energy in some air handling units has returned air being blended with outside air. Next the air is cleaned by filters and discharged into the occupied space. As the air moves through the building in ducts, the ducts pass through barriers (walls). To protect the barriers dampers are in place.

The exhaust system removes the air from an occupied space. Exhausted air is either removed from an occupied building or re-conditioned and re-used. As air is removed, it is replaced by supply air which is referred to as air exchanges.

Practical Test

The Joint Commission uses a passive test known as a “tissue test” or “flutter test” to screen ventilation. This test is only to be used as a pre-screening tool to evaluate if further investigation needs to occur. To perform the flutter test take a tissue and let it hang just off the floor near the bottom edge of a door. If the tissue indicates incorrect air flow, stabilize the area by closing doors and windows, wait a few minutes and re-test. If the organization presents a Testing & Balancing report the following questions should be asked:

A. When was the balancing done (seasonal issues);
B. Are any specific requirements (such as keeping a door closed) needed to achieve satisfactory results;
C. Is the monitoring frequency adequate? Based on what? How do you ensure system is functioning as expected?

During Survey

EC.02.05.01 EP 15 will generate a CLD when discovered during survey. However, if the organization can repair the ***process*** that led to non-compliance the Life Safety Code Surveyor (LSCS) may review the corrective action. Following LSCS review, the LSCS may contact the Central Office to discuss the ***possibility*** of reducing the CLD to SLD, however the Requirement for Improvement (RFI) will remain in the survey report. This will then require the organization to submit the Evidence of Standard Compliance (ESC) after survey, but as a SLD not require the follow-up survey. Resolution should include the area affected by the equipment identified as non-compliant, not just the identified room/area. The organization must ensure the entire zone is balanced and that there is an ongoing process to assess and ensure compliance.

Analogy: Your Home Furnace and a Commercial Air Distribution System

Your home furnace is similar to the commercial air handlers used to condition the air in our healthcare organizations. The common home furnace uses the air that enters the home through various inlets (i.e.

door opening, windows, and building leaks), or air from that return air vents (which is air that has been conditioned and used in the house and enters the return air vents. These return air vents are usually located throughout the home without a damper. Regardless of the source of the air, the air enters the supply side of the furnace. As the air enters the furnace it is first cleaned by filters, and then travels through the burners and then through the air conditioning 'A' coil. In heating months the burners are active and heats the air; in cooling months the burners are off but the 'A' coil is cooled by refrigerant which cools the air. Once the air is conditioned (either heated or cooled) it is forced by a fan into the duct work system. Once in the ductwork the air moves through the building and is discharged through vents the usually have a damper feature.

Comparison:

	Residential Heating, Air Conditioning & Cooling	Commercial Heating & Cooling
Receives outside air	**X**	**X**
Receives air from return air vents (some restrictions may apply)	**X**	**X**
Heats air by burners in the unit	**X**	
Heats air by heat source (i.e. boiler) and delivers heated product to the heating coil		**X**
Cools air by remote unit and supplies coolant to the furnace/air handler	**X**	**X**
Filters air	**X**	**X**
Humidifies/dehumidifies air	**X**	**X**
Discharges air by blowers into the occupied space	**X**	**X**
Temperature control by remote sensors (i.e. thermostats)	**X**	**X**

Evaluation of Compliance

Evaluating the Utility System: Design & Installation (EP 1)

When evaluating the design and installation of utility systems, Leadership could enter into discussion with Facilities along these lines:

A. Assuming you are currently or have recently completed a project that affected the utility systems, ask the following:
    a. How did you select the equipment/system/features for this project
        i. RESPONSE: code search; discussed with peers in ASHE; Consultant recommendations with evidence of how the equipment/system/features perform
    b. How do you know the equipment/system/features will satisfy a Joint Commission survey?
        i. RESPONSE: a code search was conducted that aligned with the expectations of the Joint Commission.
        ii. RESPONSE: once the project was complete we commissioned the equipment/system/features. Commissioning is when we ensure the equipment/system/features will operate/deliver to meet our requirements
B. If you have not recently completed a utility related project, Leadership could identify one of the systems identified in the Joint Commission Glossary (click here for hyperlink) and ask Facilities the following:

a. Can you explain the equipment/system/features of this utility system? And then, could you show me your monitoring process (as discussed in EC.04.01.01)?
    i. RESPONSE: the identified utility system supports patient care by [explanation follows].
    ii. RESPONSE: we monitor the outcome based on our experience or industry best practice (which may or may not include manufacturers' recommendations or incorporates an alternative equipment maintenance strategy)
b. Does our current installation meet the current code requirements?
    i. RESPONSE: No, but they were compliant with the original building design and installation, and we have performed a gap analysis to insure that any identified associated risks are mitigated by operational activities or use restrictions.
c. Are there significant advantages to upgrading, or should we upgrade based on current technology enhancements or code requirements?
    i. RESPONSE A: Certainly we would like to upgrade but it is not necessary to continue providing services to patient care delivery
    ii. RESPONSE B: The code community strongly supports the increased requirements that will enhance our system reliability, so our upgrading would be consistent with the experts that develop current requirements
    iii. RESPONSE C: Although our current systems are functional, from an energy conservation perspective if we upgraded we could see an ROI in 3 – 5 years, enhance the environment by reducing waste, and increase system reliability by 30% based on improved technology

Evaluating the Utility System: Ventilation, Air Filtration and Air Changes in Critical Care Areas (EP 15)

Facilities should be able to produce a list of monitoring points and a schedule. The Joint Commission has not established monitoring frequencies as each building is different, but we would expect the organization to establish this. Some organizations establish an annual Test & Balance practice, where they measure air flow and the number of air changes per hour on an annual basis, while some installed building automation system can provide data needed for air balance measurements. However, seasonal changes may affect the performance of the systems, so we would suggest the organization be able to explain the stability of the system to perform as required if they are monitoring annually. Using the simple screening of a tissue or other methods throughout the year could establish reliability and then use the annual Test & Balance to calibrate the systems.

Evaluating the Utility Systems: Shutdown Procedures for Utility Systems (EP 9)

Best practice could be to include utility shutdown procedure testing as part of a scheduled Emergency Management exercise. Leadership should review and discuss what was exercised and result of the exercise. For example, if the Emergency Management exercise included a water shut down because of a simulated contaminated water source the organization could evaluate how effective the documented procedure to isolate and shut down the water was.

Also related to the Utility Shutdown is identifying by priority the various equipment/system/features that would need to be isolated or shutdown. Establishing the potential risk or operational impact if the systems are shutdown properly will identify the clinical impact. Once the clinical impact is established the organization will need to develop communication strategies to alert staff of the shutdown. Identifying the causal impact of improper shutdown will define the proper order of shutting down a utility system.