FAQ – HVAC System General Information for Reopening with Low Exposure Risk

Assumptions: Campuses will only reopen for in-person classroom teaching and residential housing after meeting New York State's Phase IV Reopening Criteria. For on-campus isolation / quarantine facilities, please refer to ASHRAE's Epidemic Task Force Heathcare Guidance at https://www.ashrae.org/file%20library/technical%20resources/covid-19/ashrae-healthcare-c19-guidance.pdf

Q 1. Can Covid-19 be transmitted via existing air handling systems?

- There is a very low probability that the COVID-19 virus can be transmitted via air handling systems in non-healthcare settings. It is still widely documented that the disease is most easily transmitted via direct person to person contact. In general, disabling of heating, ventilating, and air-conditioning systems is not a recommended measure to reduce the transmission of the virus. (https://www.ashrae.org/file%20library/technical%20resources/covid-19/does-ashrae-s-guidance-agree-with-guidance-from-who-and-cdc.pdf).

Q 2. What can we do to reduce the risk of COVID-19 transmission via air handling system systems?

- Even the most robust HVAC system cannot control all airflows and completely eliminate dissemination of an infectious aerosol or disease transmission by droplets or aerosols. However, ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus the risk of transmission through the air.
- Reduce the amount of air that is recirculated.

Maximize the volume of fresh outside air that is introduced to the systems to the maximum extent possible. Change the air in each space at least 3 timers per hour is recommended.

- Continue regular PM to ensure that AHU equipment and filters are inspected regularly. Replace missing filters, seal all gaps between frame and filter housing.

Q 3. Should HEPA filters be used in all Air Handling Systems?

- No. Due to much higher pressure drops associated with HEPA filters, unless the fans and motors are sized to be able to overcome the increased pressure drops, this may result in unacceptable air flows, higher load on existing motors and the inability to maintain space temperature and humidity. ASHRAE recommends MERV-13 or higher filters if feasible.
- If possible, ASHRAE document calls for increasing the level of filtration in AHU's for one to two replacement cycles upon opening the building. Check filters in all buildings to ensure that there are no gaps in the filter racks and the filters are sealed and gasketed, and blanks if any are in place to maintain filter efficiency.

Q 4. What operational modifications should be made to existing HVAC systems?

- Operational modifications to HVAC systems that can be considered include increased ventilation, longer HVAC system operating hours for building flush-out, improved filtration of recirculated air, and proper airflow patterns and room pressurization. A detailed checklist of preparing HVAC systems for building re-occupancy and for operating building under the continued presence of Covid-19 can be found at xx (provide link to HVAC-SummerPrepChecklist).

Q 5. Should we run HVAC systems at 100% outside air to increase ventilation?

- While various guidance documents issued by CDC, OSHA, and ASHRAE clearly encourage building operators to increase their systems outdoor air ventilation to reduce the recirculation air back to the space, it is likely that most air handling units on campus have limitations operating under extreme weather conditions. For example, the existing cooling systems may run out of capacity when the outdoor air is very warm and humid. Likewise, we may risk freezing the heating coils that are not treated with glycol when bringing in more sub-freezing outdoor air. Each unit needs to be evaluated before changes are made to its operations.

Q 6. *Should we run HVAC systems24x7?*

- Assuming that the threat of COVID-19 has been sufficiently reduced to allow campus reopening, running buildings 24x7 is not required. Instead, schedule HVAC systems to run at least 2 hours before and after scheduled occupancy with outside air dampers open to flush-out the building on a daily basis. Occupancy schedules are expected to be longer than normal as building operation hours is extended to allow for reduced density, and custodial staff might be working overtime.
- Toilet exhaust fans and elevator cab ventilation fans should be run continuously.
- Campuses should be prepared to run their HVAC 24x7 if a need arises in response to a rise in infection or when operating under Epidemic conditions. This requires regular inspection and maintenance to ensure all equipment functions properly.

Q 7. Should we disable Demand Controlled Ventilation?

- Demand control ventilation is a control strategy that reduces the energy used for heating / cooling and ventilation of individual spaces when they are not occupied. Assuming that the threat of COVID-19 has been sufficiently reduced to allow campus reopening, disabling demand-controlled ventilation is not

required. However, all instrumentations and control apparatus (CO2 sensors, occupancy sensors, control dampers, etc.) that are used for demand control ventilation should be checked for accuracy and functionality such that they can be used to assess space ventilation adequacy.

Q 8. Should we bypass Energy Recovery ventilation units?

Energy recovery systems are present in most newer buildings as part of the energy code. Passive heat/energy recovery devices such as heat pipes, run around loops, wrap around heat pipes, etc. that completely separate the intake and exhaust air steams can continue to operate as is. In buildings where energy recovery wheels are used in air handling systems, maintenance staff should check to ensure proper clearance is maintained in the air purge section. Be prepared to bypass or slow down the rotational speed of energy recovery wheels in response to rise in infections or when operating under Epidemic conditions. Please note that bypassing or slowing the energy recovery wheels will increase the demand on the heating or cooling systems to meet space thermal comfort conditions.

Q 9. What modifications should be made to AHU's in Health Care settings?

- Please refer to ASHRAE's Epidemic Task Force Heathcare Guidance at https://www.ashrae.org/file%20library/technical%20resources/covid-19/ashrae-healthcare-c19-guidance.pdf

Q 10. What are the potential cost implications of these modifications?

- Based on some data collected from campuses that have tested their equipment with modified modes of operations, there will be 10% to 20% increase in energy cost to bring in additional outside air and extend operating hours. Additionally, operating cost will likely be impacted due to filter improvements and increased replacement frequency. Filter costs vary by campus.

Q 11. Should Ultra Violet (UV) light systems be installed as a means to reduce virus transmission?

- UVGI (ultraviolet germicidal irradiation) is only recommended by ASHRAE for HIGH RISK areas such as healthcare facilities, prisons and disaster shelters. It is not considered to be a cost-effective risk mitigation measure for LOW and MEDIUM risk areas classified based on OSHA's Hazard Recognition Standard. Portable units may make sense on a temporary basis in large meeting rooms with systems that have limited ability to bring in OA. If portable UVGI units are used, engineering and safety considerations are required to protect the wellbeing of the maintenance personnel and space occupants.

Q 12. What are the ideal temperature and humidity values?

- ASHRAE recommends temperature and humidity controls mostly to provide comfort and reduce stress for space occupants. Although a 40% to 60% humidity level is preferred, it is recognized that not all buildings have the necessary exterior insulation and HVAC equipment to maintain the desired temperature and humidity values.
- Most existing systems do not adequately control both parameters. Significant engineering redesign of the entire building is required to make proper temperature and humidity possible.

Q 13. What PPE should HVAC Technicians wear for filter maintenance?

The following are recommendations are from ASHRAE - https://www.ashrae.org/technical-resources/filtration-disinfection#maintenance

- For HVAC systems suspected to be contaminated with SARS-CoV-2, it is not necessary to suspend HVAC system maintenance, including filter changes, but additional safety precautions are warranted.

- The risks associated with handling filters contaminated with coronaviruses in ventilation systems under field-use conditions have not been evaluated.
- Workers performing maintenance and/or replacing filters on any ventilation system with the potential for viral contamination should wear appropriate personal protective equipment (PPE):
    - *A properly-fitted respirator (N95 or higher) - Note: to optimize the supply of N95 respirators, consult CDC's website before stockpiling this item.*
    - *Eye protection (safety glasses, goggles, or face shield)*
    - *Disposable gloves*
- Don't let pressure drop increase enough to disrupt room pressure differentials.
- Confirm filters remain snug in their frames.
- When feasible, filters can be disinfected with a 10% bleach solution or another appropriate disinfectant, approved for use against SARS-CoV-2, before removal. Filters (disinfected or not) can be bagged and disposed of in regular trash.
- When maintenance tasks are completed, maintenance personnel should immediately wash their hands with soap and water or use an alcohol-based hand sanitizer.

Q 14. Should air purifiers / fans be used?

- Portable air cleaners with HEPA (or > MERV 15) filters may be used in areas that don't have central air ventilation. Caution should be used when locating the units to prevent the spread of droplets. Ideally fan would be located > 6 feet from all people.

Q 15. How do we maintain proper communication with campus community regarding HVAC-COVID related issues?

- To avoid unnecessary confusions, all HVAC-COVID related questions should be directed to the designated campus staff.

Q 16. Should ductwork be cleaned?

- It is not necessary for COVID response.
- Wipe down return air diffusers in each space quarterly.