

## **RECOMMENDATIONS**

### **Short-Term Solutions**

- Repair/Replace failed motors.
- Repair UV, AHUs, and RTU outdoor air damper functionality so that mechanical equipment can provide mechanical outdoor air (OA) ventilation.
  - Repair pneumatic air leaks.
  - Reconnect pneumatic lines to actuators where required.
  - Repair/replace pneumatic actuators and components as required.
  - Repair/replace electronic actuators and components as required.
  - Reconnect/replace actuator linkages.
  - Inspect room thermostats and other controls and repair as required.
  - Ensure ALL OA dampers for ALL equipment, when equipment is on and school is occupied. Also recommend having OA dampers open for at least two hours before school is occupied and two hour hours after school occupancy has ended.
- Cleaning
  - Clean outdoor air dampers to remove dust and buildup.
  - Clean equipment coils as required to minimize airflow restrictions.
- Upgrade air filter in equipment where possible. ASHRAE recommends a minimum of MERV 13, however this not be possible for all equipment. Upgrade to highest MERV filters possible that will not greatly diminish airflow and equipment performance.
- Increase outdoor air ventilation for mechanical equipment to greatest extent possible that will not cause an issue with equipment performance and will not greatly impact indoor air temperatures and relative humidity. Increase min. OA damper set points to 25% open where possible.
- Provide portable air purification HEPA units. (The district has already done this).
- Install Needle Point Bi-Polar Ionization (NPBI) on existing UVs, FCUs, AHUs, and RTUs. Please note that most NPBI can be removed and reinstalled on replacement equipment in the future.

### **Long-Term Solutions**

#### 1. Make Red – Green:

- Install new exhaust fans for toilet rooms where missing.
- Provide new mechanical equipment to provide OA ventilation for rooms where missing. Balance new systems to provide code compliant ventilation. Options may include, but may not be limited to the followings:
  - Rooftop Air Handling Units and/or Rooftop Energy Recovery Ventilators (ERV)
  - Above ceiling (or exposed) ERV systems.
  - Fan Coil Units and/or unit ventilators.
  - Dedicated Outdoor Air Systems (DOAS).
- Provide new Needle Point Bi-Polar Ionization on new equipment.

#### 2. Replace old, outdated equipment that provides mechanical ventilation with new:

- Replace 1950/1960 vintage UVs with new including new controls. Balance replacement UV for code compliant outdoor air.
- Replace old indoor air-handling units with new including new controls. Balance replacement AHUs and all spaces served for code compliant outdoor air.
- Replace old packaged RTUs with new including new controls. Balance replacement RTUs and all spaces served for code compliant outdoor air.
- Relocate Needle Point Bi-Polar Ionization installed during Short-Term work to replacement equipment.
- Consider adding HVAC Building Management Systems (BMS) to each school and connecting new and replacement to it for monitoring and control.