**Section 350.3020 Mechanical Systems**

a) Mechanical systems shall be maintained to assure proper working order and safe operation. Instructions in the operational use of the systems and equipment shall be available at the facility.

b) Thermal and Acoustical Insulation. Insulation shall be provided for the following:

1) Boilers, smoke breeching, and stacks;

2) Steam supply and condensate return piping;

3) Hot water piping above l80 degrees Fahrenheit and all water heaters, generators, and converters;

4) Hot water piping above 125 degrees Fahrenheit that is exposed to contact by residents;

5) Chilled water, refrigerant, and other process piping and equipment operating with fluid temperatures below the ambient dew point;

6) Water supply and drainage piping on which condensation may occur;

7) Air ducts and casings with outside surface temperature below the ambient dew point; and

8) Other piping, ducts, and equipment as necessary to maintain the efficiency of the system.

c) Insulation may be omitted from hot water and steam condensate piping that is not subject to contact by residents when the insulation is not necessary for preventing excessive system heat loss or excessive heat gain.

d) Insulation on cold surfaces shall include an exterior vapor barrier.

e) Insulation, including finishes and adhesives on exterior surfaces of ducts, pipes, and equipment, shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less as determined by an independent testing laboratory in accordance with ASTM Standard E 84. Exception: Duct, pipe, and equipment coverings shall not be required to meet these requirements if they are located entirely outside of a building, do not penetrate a wall or roof, or do not create an exposure hazard.

f) Steam and Hot Water Systems. Supply and return mains and risers for cooling, heating, and process steam systems shall be valved to isolate the various sections of each system. Each piece of equipment shall be valved at the supply and return ends.

g) Thermal Hazards. Any surface that is accessible to residents and exceeds a temperature of 140 degrees Fahrenheit (such as radiators, hot water or steam pipes, baseboard heaters, or therapy equipment) shall be provided with partitions, screens, shields, or other means to protect residents from injury. Any protective device shall be designed and installed so that it does not present a fire or safety hazard or adversely affect the safe operation of the equipment.

h) Heating, Ventilating, and Air Conditioning Systems

1) *Areas of a nursing home used by residents of the nursing home* shall *be air conditioned and heated by means of operable air-conditioning and heating equipment. The areas subject to this air-conditioning and heating requirement include, without limitation, bedrooms or common areas such as sitting rooms, activity rooms, living rooms, community rooms, and dining rooms.* (Section 3-202(8) of the Act)

A) The mechanical system shall be capable of maintaining a temperature of at least 75 degrees Fahrenheit, pursuant to the requirements of Section 350.690(j).

B) The air-conditioning system shall be capable of maintaining an ambient air temperature of between 75 degrees Fahrenheit and 80 degrees Fahrenheit, pursuant to the requirements of Section 350.690(j).

2) Heaters or furnaces of a type to be installed under, in, or on the floor are not permitted.

3) All ventilation supply, return, and exhaust systems shall be mechanically operated.

4) The kitchen shall be provided with ventilation for reasonable comfort and with sufficient make-up air for the rangehood exhaust.

5) The laundry shall be provided with ventilation for reasonable comfort, with air flowing from clean areas to soiled areas and with exhaust to the outdoors.

6) Outdoor air intakes shall be located as far as practical, but not less than 15 feet, from the exhaust outlets of ventilation systems, combustion equipment stacks, plumbing vent stacks, or areas that may collect vehicular exhaust and other noxious fumes. The bottom of outdoor air intakes serving central systems shall be located as high as practical, but not less than six feet above ground level, or, if installed above the roof, three feet above roof level.

7) Air conditioning and ventilating systems shall be maintained to comply with the requirements of NFPA 90A.

8) The hood and duct system for cooking equipment used in processes that produce smoke or grease-laden vapors, such as griddle frying or deep frying, shall comply with NFPA 96. The hood's extinguishment system shall be connected to the building fire alarm system and shall initiate a general alarm when activated. Duct insulation that is used in lieu of spacing from combustible construction members shall terminate at the top of the hood on the lower end, covering the duct collar, and shall pass through any combustible nailer opening in the roof/ceiling assembly and into the roof jack assembly. The material used shall be installed exactly as the manufacturer's instructions require.

9) Boiler rooms and other rooms housing combustion equipment shall be provided with sufficient outdoor air to maintain proper combustion rates of equipment and to limit room temperatures to 20 degrees Fahrenheit over ambient inside air in adjacent interior spaces. If sealed combustion units are in use, the discharge line is to remain clear of any adjacent walk paths and shall be not less than 15 feet from any operable fenestration or air intakes. NFPA 54 shall apply, including the calculations for combustion air openings.

10) For areas within the footprint of the facility that are heated by fuel-fired appliances using an air-to-air heat exchanger, no fewer than two carbon monoxide (CO) detectors shall be installed in the area served by each heat exchanger. One CO detector shall be installed within five feet of a supply duct and one within five feet of a return or exhaust duct. CO detectors shall be line or system powered and shall signal the building fire alarm system when activated. If detectors are line powered, a battery back-up or connection to the emergency power system is required.

(Source: Amended at 35 Ill. Reg. 3461, effective February 14, 2011)