Do You Suspect Your Office Has an Indoor Air Problem?

As the public recognizes the importance of healthy, comfortable, and productive indoor environments, their awareness and demand for good indoor air quality (IAQ) increases. This demand has resulted in IAQ emerging as a major concern in office buildings.

According to the World Health Organization, 40% of all buildings pose serious health hazards due to poor IAQ.

Many office buildings have significant indoor air pollution sources. These sources include furnishings, occupant activities, housekeeping practices, pesticide applications, and microbial contamination. A factor greatly influencing the effect of these sources and the overall quality of indoor air in offices is the ventilation system design, operation and maintenance. People generally have less control over the indoor environment in their offices than they do in their homes. As a result, there are large numbers of reported health problems associated with office buildings.

The Environmental Protection Agency (EPA) tells us that indoor air pollution can be 2-5 times higher than outdoor levels.

Health Effects

A number of well-identified illnesses, such as Legionnaire's disease, asthma, hypersensitivity pneumonitis, and humidifier fever, have been directly traced to specific building problems. These are called building-related illnesses. Most of these diseases can be treated; nevertheless, some pose serious health risks and may require prolonged recovery times after leaving the building.

20% of all employees have a major illness related to indoor air pollution such as allergies, asthma, autoimmune diseases, etc.

Sometimes, however, building occupants experience symptoms that do not fit the pattern of any particular illness and are difficult to trace to any specific source. People may complain of one or more of the following symptoms: dry or burning mucous membranes in the nose, eyes, and throat; sneezing; stuffy or runny nose; fatigue or lethargy; headache; dizziness; nausea; irritability and forgetfulness. These symptoms may or may not be related to poor indoor air quality. Poor lighting, noise, vibration, thermal discomfort, and psychological stress may also cause, or contribute to, these symptoms. There is not single manner in which these health problems appear. The complaints may be localized in a particular room or zone, or may be

widespread throughout the building. When most of the complainants report relief of these symptoms soon after leaving the building, the phenomenon has been labeled sick building syndrome.

EPA estimate that 18% of annual production loss to American business is due to poor IAQ

What Causes Problems?

Three major reasons for poor indoor air quality in office buildings are the presence of indoor air pollution sources; poorly designed, maintained, or operated ventilation systems; and uses of the building that were unanticipated or poorly planned for when the building was designed or renovated.

Sources of Office Air Pollution

As with homes, the most important factor influencing indoor air quality is the presence of pollutant sources. Commonly found office pollutants and their sources include environmental tobacco smoke; asbestos from insulating and fire-retardant building supplies; formaldehyde from pressed wood products; other organics from building materials, carpet, and other office furnishings, cleaning materials and activities, restroom air fresheners, paints, adhesives, copying machines, and photography and print shops; biological contaminants from dirty ventilation systems or water-damaged walls, ceilings, and carpets; and pesticides from pest management practices.

Ventilation Systems

Mechanical ventilation systems in large buildings are designed and operated not only to heat and cool the air, but also to draw in and circulate outdoor air. If they are poorly designed, operated, or maintained, however, ventilation systems can contribute to indoor air problems in several ways.

For example, problems arise when, in an effort to save energy, ventilation systems are not used to bring in adequate amounts of outdoor air. Inadequate ventilation also occurs if the air supply and return vents within each room are blocked or placed in such a way that outdoor air does not actually reach the breathing zone of building occupants. Improperly located outdoor air intake vents can also bring in air contaminated with automobile and truck exhaust, boiler emissions, fumes from dumpsters, or air vented from restrooms. Finally, ventilation systems can be a source of indoor pollution themselves by spreading biological contaminants that have multiplied

in cooling towers, humidifiers, dehumidifiers, air conditioners, or the inside surfaces of ventilation duct work.

There are more than 4.6 million commercial buildings in the U.S. today. And while some of these facilities were built or upgraded in recent years with the latest in technology and systems for occupant comfort and convenience, others are still using pre-WWII filter technology in their HVAC systems.

Use of the Building

Indoor air pollutants can be circulated from portions of the building used for specialized purposes, such as restaurants, print shops, and dry-cleaning stores, into offices in the same building. Carbon monoxide and other components of automobile exhaust can be drawn from underground parking garages through stairwells and elevator shafts into office spaces.

In addition, buildings originally designed for one purpose may end up being converted to use as office space. If not properly modified during building renovations, the room partitions and ventilation system can contribute to indoor air quality problems by restricting air re-circulation or by providing an inadequate supply of outdoor air.

What to Do If You Suspect a Problem

If you or others at your office are experiencing health or comfort problems that you suspect may be caused by indoor air pollution, you can do the following:

Talk with other workers, your supervisor, and union representatives to see if the problems are being experienced by others and urge that a record of reported health complaints be kept by management, if one has not already been established.

Talk with your own physician and report your problems to the company physician, nurse, or health and safety officer.

Call your state or local health department or air pollution control agency to talk over the symptoms and possible causes.

Contact a qualified professional to conduct a comprehensive building investigation. Frequently, indoor air quality problems in large commercial buildings cannot be effectively identified or remedied without a comprehensive building investigation. These investigations may start with written questionnaires and telephone consultations in which building investigators assess the

history of occupant symptoms and building operation procedures. In some cases, these inquiries may quickly uncover the problem and on-site visits are unnecessary.

More often, however, investigators will need to come to the building to conduct personal interviews with occupants, to look for possible sources of the problems, and to inspect the design and operation of the ventilation system and other building features. Because taking measurements of pollutants at the very low levels often found in office buildings is expensive and may not yield information readily useful in identifying problem sources, investigators may not take many measurements. The process of solving indoor air quality problems that result in health and comfort complaints can be a slow one, involving several trial solutions before successful remedial actions are identified.

If a professional company is hired to conduct a building investigation, select a company on the basis of its experience in identifying and solving indoor air quality problems.

Work with others to establish a smoking policy that eliminates involuntary nonsmoker exposure to environmental tobacco smoke.

Contact Wynn L. White Consulting Engineers for advice and information on building investigations. We have extensive experience identifying and remedying indoor air quality issues. Call Wynn at (225) 761-9141 ext. 24.