TEAMSTERS Safety & Health FACTS
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Sick Building Syndrome

Sick Building Syndrome (SBS) is the common name for a host of physical complaints experienced by a large percentage of building occupants. Common symptoms include headache; eye, nose and throat irritation; dry or itchy skin; dizziness; nausea; and sensitivity to odors. Occupants often complain of chronic fatigue and the inability to concentrate. Some suffer allergic reactions and asthma. Most occupants report relief when leaving the building.

When complaints escalate to illnesses with coughing, chest tightness, fever, chills and muscle aches, occupants or workers are suffering from a "building-related illness." It may take long periods of time to recover from these illnesses.

In most cases, indoor air pollution accounts for these problems. The pollution can come from several sources, most notably:

- Inadequate Ventilation. Most ventilation systems should be designed to provide as much as 15 cubic feet per minute, of outside air for every occupant. High carbon dioxide, a gas we all exhale, levels are a sure indicator of the lack of fresh air and the possible presence of other contaminants. Although carbon dioxide is not dangerous in levels found in most buildings, high concentrations have been associated with fatigue, drowsiness, and the inability to concentrate.

- Indoor Air Pollutants. These pollutants can come from all types of sources within a building. For instance, certain insulation material can give off formaldehyde, an irritating and sensitizing chemical. Adhesives, carpeting, pesticides, copying machines and cleansers can emit irritating or toxic organic compounds into the office atmosphere.

- Outside Air Pollutants. Indoor air can be contaminated from sources outside the building. The outside air intakes are often placed in improper positions, e.g., next

to loading docks, plumbing vents and other building exhausts. As a result, motor vehicle exhaust smoke, toilet gas and other contaminants can be drawn into the building. Several cases of sick building syndrome have involved carbon monoxide and nitrogen dioxide entering a building from an attached parking lot or an underground garage.

- Biological Contamination. Bacteria, molds, pollen, and viruses can be a troubling source of contamination. HVAC systems are often the culprit. Biological organisms may breed in stagnant pools in humidifiers and cooling coil-condensed pans. Often, small leaks in pipes and roofs permit water to accumulate behind walls or ceiling tiles. Bacteria and molds can grow unnoticed until symptoms begin. Coughing, chest tightness, chills fever and allergies are the most common complaints related to biological contamination.

Air sampling for contaminants

Sampling for contaminants might seem to be the logical response to the employee complaints, but it seldom provides information about possible causes. While certain basic measurements, e.g., temperature, relative humidity, carbon dioxide, and air movement, can provide a useful depiction of current building conditions, sampling for specific pollutant concentrations is often not required to solve the problem and can even be misleading. Contaminant concentration levels rarely exceed existing standards and guidelines even when employees continue to report health complaints. Air sampling should not be undertaken until considerable information on the factors listed above has been collected. Any sampling strategy should be based on a comprehensive understanding of how the building operates and the nature of the complaints.

Solutions to Sick Building Syndrome

Solving this problem usually will include combinations of the following:

- Pollutant source removal or modification is an effective approach to resolving an IAQ problem when sources are known and control is feasible. Examples include routine maintenance of HVAC systems, e.g., periodic cleaning or replacement of filters; replacement of water-damaged ceiling tile and carpeting; institution of smoking restrictions; venting contaminant source emissions to the outdoors; storage and use of these pollutant sources during periods of non-occupancy; and allowing time for building materials in new or remodeled areas to off-gas pollutants before occupancy. Several of these options may be exercised at one time.

- Increasing ventilation rates and air distribution often can be a cost effective means of reducing indoor pollutant levels. Your HVAC systems should have been designed, at a minimum, to meet the ventilation standards of the local building codes; however, many systems are not operated or maintained to ensure that these design ventilation rates are sustained. In many buildings, IAQ can be improved by operating the HVAC system to at least its design standard, and to ASHRAE Standard 62-1989, if possible. When there are strong pollutant sources, local exhaust ventilation may be appropriate to exhaust contaminated air directly

from the building. Local exhaust ventilation is recommended to remove pollutants that accumulate in specific areas such as restroom, copy rooms, and printing facilities.

- Air cleaning can be a useful addition to source control and increased ventilation rates but it has certain limitations. Particle control devices such as the typical furnace filter are inexpensive but do not effectively capture small particles; high performance air filters capture the smaller, respirable particles but are relatively expensive to install and operate. As mentioned above, mechanical filters do not remove gaseous pollutants. Some specific gaseous pollutants may be removed by adsorbent beds, but these devices are expensive. Air cleaners can be useful, but have limited applications.

- Education and communication are important elements in both remedial and preventive indoor air quality management programs. When building occupants, management, and maintenance personnel fully communicate and understand the causes and consequences of IAQ problems, they can work more effectively together to prevent problems from occurring, or to solve them if they do.