

Sick Building Syndrome

Presented by MARCOR Remediation, Inc.

The term *sick building syndrome* (SBS) emerged in the 1970s and is commonly used to describe situations in which multiple building occupants experience health maladies or environmental discomfort, but no discernable link between the building source and the problems experienced can be clearly identified (i.e., a causal relationship is lacking). The occupants' symptoms clear up upon leaving the building and living or working elsewhere for a while, and then resume upon return to the building. Some individuals may exhibit a greater sensitivity than others, but in general, the pattern of complaints includes at least 20 percent of a building's occupants.

Building-related illness, or BRI, is a related term that is used when the cause(s) are identified and can be attributed to specific contaminants in the building. It generally refers to cases where building occupants suffer from a particular ailment such as Legionnaire's disease, for example, which is caused by a specific bacterium.

Contributing causes of SBS may include bacteria, mold, mildew, fungi, odors (smoke, pets, chemicals, etc.), poor air circulation, and animal excrement such as bird or rodent droppings. In addition, chemicals and synthetic products that emit volatile organic compounds (VOCs) can cause health problems if concentrations are high enough. Some examples include adhesives, carpeting, upholstery, copy machines, benzene, insulation and wood products containing formaldehyde, pesticides, and cleaning agents. Health problems caused by inhalation of asbestos fibers are not technically attributed to sick buildings because the illness develops over time, typically many years after exposure occurs.

The most common symptoms reported in sick building cases include fatigue, throat irritation and/or dry cough, sinus congestion, headaches, rashes, cold- and flu-like symptoms, dizziness, nausea, difficulty concentrating, sensitivity to odors, itchy skin, or some combination of these. Others symptoms, especially those associated with specific mold species, may be more severe.

The Ventilation Factor

Fresh air and air movement within a building keep it “flushed.” When buildings are tightly sealed to conserve energy or repartitioned as a result of remodeling, inadequate air exchange may cause contaminants to accumulate. Poor design or infrequent maintenance of heating, ventilation, and air conditioning (HVAC) systems can also create problems.

In the early and mid-20th century, building ventilation standards required approximately 15 cubic feet per minute (cfm) of outside air for each building occupant. As a result of the 1973 oil embargo, however, national energy conservation measures called for a reduction to 5 cfm per occupant. In an effort to make new buildings more energy efficient, they were constructed very tightly, and the air within was re-circulated. In addition, a variety of particle- and chemical-emitting materials and objects were added, which only exacerbated the indoor air quality (IAQ) problems and compromised the health and/or comfort of occupants. In 1989, the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) revised the ventilation standard to 15 cfm per person, or 20 cfm per person in office spaces.

Aside from regular duct cleaning activities, maintaining a building’s HVAC system is the most important step a facility manager can take to prevent sick building outbreaks. Increasing

ventilation rates and air distribution can also be a cost-effective way of improving IAQ, but it is not a cure-all for SBS. A number of contaminants may need to be addressed in tandem with improved HVAC operation.

Mold/Microbial Contamination

Over the past few years, amplified mold growth has become a high-profile health and environmental concern, as well as the subject of controversy and litigation. Building owners and managers must be diligent in their approach to prevent and/or respond to mold problems. There may be microbial growth inside wet ductwork and other air-handling components. Or there may be mold growth attributable to catastrophic flooding, a plumbing mishap that goes undetected, structural damage that allows water intrusion, or poor construction practices. The key to controlling mold spores is to first eliminate the source of the problem, usually attributable to water intrusion combined with other conditions conducive to mold growth.

There are many species of mold, but one of the most common and potentially the most dangerous to human health is *Stachybotrys chartarum (atra)*, which is commonly found in homes or buildings that have sustained water damage. The mold may be found on the paper covering of sheetrock but can also grow inside walls, where it may grow profusely but not be readily apparent.

Solving SBS Problems

Building investigation, testing, and sampling operations should be handled by qualified consultants and laboratories. The actual remediation efforts must be performed by non-affiliated

remediation contractors (i.e., no conflict of interest). Remediation contractors should possess the following qualifications:

- Demonstrated experience and expertise with similar projects
- Insurance covering all pollutants, with no exclusion for microbial matters
- Résumés of key project personnel demonstrating commitment to industry excellence (i.e., credentials, training courses, and industry-recognized certifications)
- Proof of written work practices and standard operating procedures specific to the work to be performed
- Demonstrated expertise in the effective operation of HEPA-filtered equipment, including a written equipment operation program and written integrity-testing program for HEPA equipment
- Documentation of participation in OSHA-mandated safety programs

Post-remediation confirmatory sampling should always be performed by a third party.

In Summation

Some SBS problems are so complex, that industrial hygienists, occupational physicians, and mechanical engineers may disagree on the causes of the problem. An educated, common sense approach; systematic elimination of potential sources; and concerted remediation efforts may be the only solution for tough cases. Fortunately, however, many IAQ problems that draw occupant complaints are not that serious. The IAQ can be improved through better operation and maintenance procedures, resulting in productive, happy tenants with no lasting health effects.

A few words of caution: Individuals must be careful when using the term SBS due to the fact that a property labeled as a “sick building” can have serious financial and legal implications for the owner. From the building owner or manager’s perspective, responding immediately and aggressively to IAQ complaints from occupants sends the message that their health and well-being are important and valued and may also help to limit liability. Timely communications about the problem combined with qualified remediation efforts demonstrate good faith and responsible building management.

For additional information, please visit www.marcor.com or contact Johney Robinson, Business Development Manager in MARCOR’s Salisbury operation, at 410-251-3149 / 800-247-0369 or robinsj@marcor.com.