

CWA Occupational Safety and Health Fact Sheet #20

Indoor Air Quality & the Workplace

CWA's more than 500,000 members employed in office environments are exposed to many work-related occupational safety and health hazards. In coordination with the Union's Occupational Safety and Health Department, local leaders and members have identified many of these offices as containing hazardous and unhealthful materials. A primary office safety and health problem is indoor air pollution.

Air Quality

An indoor air pollution problem exists when a limited amount of fresh air is circulated throughout the office work environment (tight building syndrome), air is circulated at too fast a rate within the workplace, toxic substances are present in the office environment, or outside air circulated into the workplace is polluted.

There are several variables that contribute to indoor air pollution. Such factors include the use of chemicals like formaldehyde in carpets and furniture; carbon monoxide given off by cigarette smoke and outside traffic; polychlorinated biphenyls contained in electrical transformers; radiation from building insulation; ozone from copiers; and solvents used in cleaners, glues, copiers; and the ventilation system itself.

Also, there are natural causes for indoor air pollution. For example, humans exhale carbon dioxide, which in small quantities is not toxic, but may become hazardous if high concentrations are allowed to accumulate. Micro-organisms or bacteria may also be present within the ventilation system. If micro-organisms do develop, they may spread throughout the entire workplace or building by means of the ventilation system.

In part, air quality problems are created and compounded by the "sealed buildings" in which many people work. The design of these buildings, intended to reduce energy costs, has been identified as a major source or contributor to worker-reported health symptoms.

Another reason for poor air quality may be inadequate ventilation. As noted, the amount of fresh air and its cleanliness are important factors in determining air quality. An efficient, well-maintained ventilation system will circulate and substitute fresh air for used/stale air. Although ventilation systems are not designed to remove large amounts of air contaminants, the ventilation system may sufficiently reduce the level of air pollution.

In the case of redesigned "open space" offices, severe ventilation problems may exist. It is not uncommon to see partitions and walls filling previously "open space" offices. Although such spatial divisions may provide needed privacy, CWA members may notice that their work area contains dead or polluted air. This situation is caused because there is inadequate circulation of fresh air. Most often these conditions result from either not having supply and exhaust vents within each separate room or work area or from inadequate maintenance of the ventilation system. To ensure adequate ventilation, the employer should design or redesign the office

environment so that each work area has properly operating supply and exhaust vents.

Health Effects

Many health symptoms that office workers experience are promoted or caused by indoor air pollution. Physical symptoms such as headaches, sinus discomfort, upper respiratory congestion, and eye irritation are the result of contaminated air. Also, in some cases, indoor air pollution may cause serious infections like Legionnaires' Disease, a type of pneumonia.

In addition, worker health symptoms such as colds, headaches, drowsiness, irritation, and irregular breathing may be brought on as the result of temperature extremes, improper humidity levels, and too little or too much air circulation. Workplace temperatures should be maintained between 68 degrees- 75 degrees Fahrenheit and humidity levels between 30%- 60%. In addition, drafts caused by too much air circulation should be avoided.

Compounding the noted health symptoms may be job stress. In part, due to various aspects of office automation, the most stressful elements of office work are increasing. Health symptoms associated with job stress include psychological and physical strains such as frustration, anxiety, irritability, anger, depression, stomach or gastro-intestinal disturbances, and muscle and psychological tension. These symptoms may be promoted by poor indoor quality.

Solving Ventilation Problems

A primary factor in the prevention of health symptoms is an efficient, properly designed and operating ventilation system. The ventilation system determines the quality of the indoor air by controlling the amount of air that is added to the workplace atmosphere, the cleanliness of such outside air, and the rate at which the office air and its pollutants are either exhausted to the outside or re-circulated throughout the building.

Having identified office air pollution and ventilation problems, we must consider ways of resolving them. Following are some suggestions:

First, worker health symptoms and their causes need to be identified. Discussions with workers, review of employer-maintained records of worker injuries and illnesses, and development, distribution, and analysis of a brief health questionnaire should accomplish this need.

Talking with co-workers is one of the easiest ways to identify the occurrence and, sometimes, causes of employee health symptoms. Requested information might include the use of contaminants within the workplace, the occurrence and type of health symptoms, and the time of the day, week, and year when health symptoms occur most frequently.

Employer-maintained records of workplace injuries and illnesses should be requested and reviewed. Quite often, such information will indicate the occurrence of patterns of similar health symptoms caused or promoted by air pollution and improper ventilation.

A health questionnaire should be developed and distributed to all concerned workers. Such a tool should identify the number of people affected; specify ages and job descriptions of involved

workers; determine where they are located within the office; indicate when the symptoms occur (time of day, day of week, and time of year); provide a list of specific health symptoms or illnesses; identify all machines operated in the workplace; indicate the type of outside air pollution; and identify potential sources of job stress.

Second, identification of contaminant sources is often crucial to determining the cause(s) of worker health symptoms. Such information can sometimes be obtained by requesting copies of air monitoring data from the employer. If monitoring data is not available, yet a high number of health symptoms have been reported, the Union representative should request that the employer have air monitoring tests conducted. Review of this data may identify potentially hazardous sources of contamination and resultant worker health symptoms. However, when contaminant concentrations are very low, monitoring data may not explain the observed or reported health symptoms.

If no contaminant sources are found, it is still possible that an indoor air pollution problem exists. Excessive re-circulation of air leads to "stale air" conditions. Stale air has higher levels of carbon dioxide and carbon monoxide (produced from human breathing and cigarette smoke, respectively) than outside air. Stale air may also be a problem when ventilation is not sufficient to account for an increase in the number of workers in the area.

As noted, improper temperature and humidity levels, and too little or too much air circulation may also contribute to worker health complaints. Temperature levels should range from 68 degrees - 75 degrees Fahrenheit and humidity levels between 30% and 60%. In addition, drafts caused by too much air circulation should be avoided. Maintenance of proper temperatures and humidity levels and proper air circulation will help to reduce the occurrence of upper respiratory symptoms, and, possibly, skin rashes.

Third, the condition of the ventilation system should be documented. Copies of maintenance records should be requested. Analysis of this information will indicate whether equipment is routinely serviced and operating properly.

In addition, ventilation system design operating standards, as well as minimum fresh outside air requirements, are provided by the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). The ASHRAE standard endorses the importance of worker complaints in judging indoor air quality. ASHRAE defines acceptable air quality as:

"Air in which there are no known contaminants at harmful concentrations and with which a substantial majority (80% or more) of the people exposed do not express dissatisfaction."

ASHRAE calls for office environments to be provided with 20 cubic feet of fresh outside air per minute per person (cfm/person).

Also, ASHRAE states that 1/10 the OSHA air contaminant levels should be used when evaluating air sampling or monitoring results. This reduction is based on the fact that OSHA

standards apply to healthy workers, whereas office buildings allow access to the general population, including the very young, the sick, and the old. Employers should ensure that ventilation systems meet ASHRAE guidelines.

After gathering materials to identify worker health symptoms and their causes, this information should be organized and presented to management for resolution. Remedies for health symptoms might include the adjustment of air handling equipment and variation in the amount of re-circulation. Also, the rate of air turnover can be adjusted. Ventilation ducts can be added to provide better distribution of the air. The number of workers in an area can also be varied to allow adherence to the ASHRAE 20 cfm/person requirements.

What Can You Do?

All CWA members should make sure that their employer is maintaining a safe and healthful workplace, i.e., one that is free of hazardous contaminants and supplied with clean, fresh air. The key to making the workplace safe for CWA members is strong, active local safety and health committees. The committee can identify dangerous conditions at the workplace and discuss them with management. If the employer refuses to cooperate, the committee can request an OSHA inspection. The committee should always coordinate its activities through local officers, the CWA Representative, and negotiated safety and health committees.

In addition, CWA members may obtain information and assistance by contacting the:
CWA Occupational Safety and Health Department
501 Third Street, N.W.
Washington, D.C. 20001-2797
Webpage: www.cwasafetyandhealth.org
Telephone: (202) 434-1160.

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