

# SERVICE EMPLOYEES

INTERNATIONAL UNION, AFL-CIO, CLC

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JOHN J. SWEENEY  
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January 21, 1992

Docket Officer  
Docket No. H-122, Room N-2625  
Occupational Safety and Health Administration  
United States Department of Labor  
200 Constitution Avenue, NW  
Washington, DC 20210

**RE: Request for Information on Occupational Exposure to Indoor  
Air Pollution**

## Introduction

The Service Employees International Union (SEIU) would like to thank the Occupational Safety and Health Administration for this opportunity to provide information to support the initiation of OSHA regulatory action to protect American workers from the most ubiquitous hazard present in today's "modern" workplace.

SEIU represents nearly one million workers in the United States and Canada. The majority of our members work in public and commercial buildings; many exposed daily to either lack of fresh air, indoor air pollutants, or a combination of both. Our members work in hospitals, primary and secondary schools, colleges, government buildings, and office buildings as professional and clerical workers, and building service and maintenance workers.

While we welcome the opportunity to respond below with more detailed scientific and technical information as requested, we must regrettably conclude that after trying for many years to get the federal government to take more reasonable and responsible steps to protect workers and the public at large from indoor air quality problems, that the major obstacles to progress on this issue continue to be much more political and ideological in nature, than of scientific and technical origin.

## The Scope of the Problem

SEIU receives more complaints and requests for assistance from our 300 local unions, its members, and the general public on indoor air quality than on any other health and safety issue.

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### Introduction

The Service Employees International Union (SEIU) would like to thank the Occupational Safety and Health Administration for this opportunity to provide information on the most ubiquitous hazard of OSHA regulatory activity: indoor air pollution.

SEIU represents more than 2 million workers in the United States and Canada. The majority of our members work in public buildings and commercial buildings, including hospitals, colleges, government buildings, and clerical workers.

While we welcome the opportunity to respond below with more detailed scientific and technical information as requested, we must regrettably conclude that after trying for many years to get the federal government to take more reasonable and responsible steps to protect workers and the public at large from indoor air quality problems, that the major obstacles to progress on this issue continue to be much more political and ideological in nature, than of scientific and technical origin.

### The Scope of the Problem

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would like information for the initiation from the workplace.

the United States in public buildings or lack of controls, as professional maintenance

The plight of today's building occupants has been greatly exacerbated when the policies of the energy crisis of the early 1970's encouraged the construction of buildings with windows that don't open while simultaneously reducing the amount of outside air circulated into buildings in order to save heating and cooling costs. Increasingly toxic materials used to manufacture furniture, other building materials and contaminated sources of outside air, all contribute further to this massive nationwide problem.

As the nation's largest representative for building service and maintenance workers, another formidable problem that we must contend with is that many of our members work in buildings when the mechanical ventilation systems are completely shut off. Combined with the reality of working with toxic cleaning compounds, the situation becomes even more serious. Yet, California, under CalOSHA regulations, is the only state in the country that requires that the ventilation system be turned on while workers are present.

A recent Congressional General Accounting Office report indicated that 75 EPA scientists, engineers and managers ranked indoor air pollution as the fourth most serious environmental threat among 31 categories that the citizens of our country face. Yet the US EPA spends only 1.3% of its annual budget on this issue, and OSHA is not even capable of estimating the level of resources committed to protecting workers from this hazard.

In this same GAO report, NIOSH estimates that indoor air quality problems comprise one-third of its health and safety complaints, and make up the largest complaint category.

In another report by EPA to Congress, the agency has stated that in the workplace environment alone, that poor indoor air quality is costing our economy \$60 billion dollars per year just in lost worker productivity.

Finally, according to the Sheet Metal and Air Conditioning Contractors' National Association Inc., the cost of worker absenteeism due to poor indoor air quality averages \$2.70 per square foot of building space. Comparatively, the cost of improved building ventilation is only \$.02 per square foot. It is, therefore, cost-effective to our nation's economy and to our workers' health to improve indoor air quality.

#### OSHA's Response

OSHA's actions to date has been to issue a very deficient field compliance directive on indoor air quality. The directive

states that air quality problems "usually involve one or two employees." OSHA's directive also states that some complaints could be described as "perceptions of discomfort". OSHA states that experience indicates that a majority of complaints "do not present situations which threaten serious harm". (An SEIU member who lost his lung due to an air quality problem might disagree with that analysis.)

Such unsubstantiated blanket statements do much more harm than good and illustrates a serious lack of knowledge and understanding by OSHA about even the most rudimentary aspects of indoor air problems. Furthermore, the directive highlights a great level of insensitivity to the suffering of millions of workers caused by indoor air problems.

SEIU and other unions were invited to comment on the draft. While OSHA graciously invited us to a meeting to discuss our comments, a second meeting to respond to our suggestions was promised, but then was cancelled and never rescheduled. The result was that the draft has now become the final without incorporating any of the suggested improvements.

#### Need for Federal Action

OSHA's legal mandate is to protect workers from recognized hazards. OSHA must play a larger role in shaping indoor air quality protection for office workers.

EPA has produced excellent indoor air quality educational materials for building owners and managers, but has chosen not to use its existing authority to regulate in this area.

The time is now ripe for EPA and OSHA to exercise a much greater willingness to deal responsibly with indoor air quality concerns. As a first step, we recommend that the two agencies immediately set up an interagency task force which will finally begin to take positive actions to seriously address indoor air quality issues. Furthermore, we recommend that OSHA and EPA convene an external advisory committee composed of representatives from the range of organizations that have gained a reputation for advocating for a responsible public health based approach to resolving indoor air quality problems through appropriate federal rulemaking actions.

In addition, a reversal of President Bush's opposition, and active support by OSHA and EPA for the Indoor Air Quality Acts of 1991 (H.R.1066 and S. 455) is needed if we are to secure passage of this most important legislation to provide for adequate research funds to continue to study indoor air problems.

SEIU Activities

SEIU and its local unions throughout the country have responded to indoor air problems in a number of ways, including working to find legislative solutions. Through our efforts, legislation requiring state buildings to meet specific criteria for ventilation and indoor air quality has been enacted in the states of New Hampshire and Maine. We have lobbied successfully for the introduction of legislation in other states to improve indoor air quality. And, we have been fighting for legislation at the federal level since 1988.

SEIU also has been working in other arenas to improve the quality of indoor air in buildings where our members work. Our experiences point to what OSHA needs to do. Fixing an indoor air quality problem involves much more than an industrial hygienist monitoring the air for a specific chemical. As these examples show, workers need to be involved in the abatement process, and employers are often slow to recognize and fix the problems.

**Case Study #1**

In 1986, employees at the Ridgefield, Connecticut high school were experiencing health complaints including respiratory problems, burning eyes, burning throats, fatigue and nausea. Town officials contacted various agencies for advice, but were not able to determine the cause of the problem. An industrial hygienist from the Yale Occupational Health Clinic and an SEIU health and safety representative conducted an investigation and reviewed the results of testing to determine the level of carbon dioxide. Carbon dioxide testing is commonly used to determine if the ventilation system is providing sufficient amounts of fresh air. Our investigation and test results confirmed employees' suspicions that an inadequate amount of fresh air was entering the workspace. We recommended that the employer increase the fresh air intake to improve the balance of the ventilation system. After these recommendations were implemented, the number of symptoms reported by workers was greatly reduced. Improved training for the building management on how to improve the air quality was also needed.

**Case Study #2**

In Augusta, Maine, SEIU members working at the Department of Transportation headquarters faced air quality problems for many years, despite working in a relatively new building. Even though standards, a history of air quality tests documenting inadequate fresh air distribution, and requests from the workers to renovate the ventilation system existed, the employer resisted making changes to improve the heating, ventilation and air conditioning

systems. Concerted efforts by employees and mid-level management finally yielded a commitment to upgrade the ventilation system. As this example demonstrates, we clearly need national standards for new buildings and a national hotline for employers and employees to call if problems are not getting fixed.

#### Case Study #3

SEIU members frequently face problems at facilities known as "mixed use" buildings. A mixed use building houses both offices and industrial workplaces. In 1990, the Western Area Mental Health Clinic in Westfield, Massachusetts moved into the second and third floors of a former mill partially converted to office space. The first floor housed some manufacturing businesses such as a debarring shop, a tool and dye shop, and a small engine repair shop. Tests identified formaldehyde, 1,1,1-trichloro-methane, perchloroethylene and mineral spirits in the office air. In addition to these chemicals, carbon dioxide levels were between 900 and 1000 ppm during low occupancy of the building. Outside levels are 300 to 330 ppm, and usually readings above 700 ppm corresponded to a number of occupants having symptoms. Occupational physicians have found that a number of our members working at the clinic face serious health problems as a result of their exposures to this chemical mixture. We have not yet been successful in reducing these contaminants from the air our members must breathe.

#### Case Study #4

In Augusta, Maine, state Human Services office workers, whose office is located in a strip mall, are exposed to air that has been contaminated by emissions from a boiler, and general exhaust from a dry cleaner located in the same shopping plaza. Plans are being developed to reduce the amount of the contaminants in the air. Some minimum national standards are urgently needed to prevent similar problems in other "mixed use" facilities.

#### Case Study #5

Manchester Community College in Manchester, Connecticut is typical of many schools built since the early 1970s. Built to be energy efficient, it has many air quality problems. A workplace inspection, worker interviews, and air quality testing revealed that the employees were experiencing respiratory and other "sick building syndrome" symptoms, and that carbon dioxide levels were elevated. SEIU provided information and made recommendations to the employer that led to employee training, adjustments to ventilation system operations, and new ways to use cleaning chemicals to reduce exposure.

**Case Study #6**

In the Exeter, Connecticut firehouse, SEIU member firefighters worked in an area with poor air quality. Air tests determined that carbon dioxide levels were up to 900 ppm and members were experiencing various health problems. The ventilation system was poorly maintained. Cleaners, paints and degreasing solvents used to maintain the trucks contributed to the problem by evaporating into the air. Our recommendations for improving maintenance was implemented, and improved localized ventilation reduced the amount of chemicals in the air.

We believe that SEIU's field experience clearly reinforces that there is a great need for federal regulatory activity to protect workers from indoor air pollution.

Answers to OSHA Request for Information On Occupational Exposure To Indoor Air Pollutants

(1) How would you define poor indoor air quality?

Indoor air pollution should be defined as a condition which results in discomfort or one or more health symptoms in building occupants caused by lack of fresh air, temperature extremes, presence of chemical or microbial contaminants, low oxygen level, or other indoor air problems that cause discomfort or health problems for building occupants.

(2b) Based on observations in your workplace or your knowledge of research results, describe the adverse effects that you believe may be attributable to the quality of indoor air.

After surveying thousands of workers across the country, SEIU compiled actual survey responses that list adverse health effects caused by indoor air pollution. These include headaches, nose congestion or irritation, throat irritation, dry cough, dry or itchy skin, dizziness, nausea, lethargy or fatigue, colds, asthma/wheezing, chest tightness, runny nose/post nasal drip, eye or contact lens irritation, respiratory difficulties. In addition, EPA estimates that pollutants found in indoor air are responsible for 2,500 to 6,500 cancer deaths each year.

(2c) What percent of the workforce suffers adverse health effects due to poor indoor air quality in their workplace? What is the basis for your estimates?

On average, 50-70% of workers who have completed SEIU's

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indoor air pollution survey have experienced health symptoms associated with "sick building syndrome".

In one survey of 2,586 members of SEIU Local 668 employed by the Commonwealth of Pennsylvania, workers reported experiencing the following symptoms caused by the air in the building, at least several times a month:

- \* Unusual Fatigue or Drowsiness (39%)
- \* Headaches (39%)
- \* Sinus Congestion (31%)
- \* Eye Irritation/Itching/Watering (30%)
- \* Eye Strain (30%)
- \* Throat Irritation/Sore Throats (23%)
- \* Runny Nose, Post-Nasal Drip (22%)
- \* Difficulty in Concentrating (21%)
- \* Allergies, Hay Fever, Breathing Difficulties (20%)
- \* More Frequent Colds (14%)

In another larger survey conducted in 1987 of over 3,600 state employees that work in Maine and New Hampshire, EPA analyzed the results and found the following percentages of symptoms:

- \* Unusual Fatigue or Drowsiness (44%)
- \* Headaches (30%)
- \* Eye Strain (37%)
- \* Loss in Productivity (69%)

(2d) Based on observations in your workplace or your knowledge from other sources, how much lost work time and decreased productivity may be traceable to illnesses related to poor indoor air quality? What is the basis for your estimate?

EPA estimates \$60 billion is lost in decreased productivity due to poor indoor air quality annually. However, estimates of work time lost due to indoor air pollution may not be an effective way to measure the extent of the problem, because many workers do not make the connection between their symptoms and discomfort and indoor air pollution. Workers will continue to work while experiencing discomfort, or will attribute their use of sick leave to other causes.

Results of a Pennsylvania statewide indoor air quality survey conducted by SEIU Local 668 indicate that poor air quality can cost employers millions of dollars in lost work time and productivity. Respondents reported missing on average of 2.85 days per year due to poor air quality.

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With 10,000 Local 668 members earning an average of \$110 per day, the state loses over \$3.1 million per year in lost work time due to indoor air quality problems for this group of workers alone. Respondents also reported that on average they were 15% less productive because of poor indoor air quality. This means poor indoor air quality translates into \$8.6 million per year in lost productivity for this group of workers. If you add in the cost of medical visits due to poor indoor air quality, then the total cost of poor indoor air quality to the state is about \$12.5 million per year in lost work time, lost productivity, and medical costs.

In addition, record-keeping on air quality-related symptoms is inadequate. Health insurance carriers probably do not look for an excess of claims in the area, and, therefore, will not base insurance rates on the impact of indoor air pollution alone.

(4) The Agency solicits additional data relevant to the development of more precise estimates of the number of workplaces with indoor air quality problems and the number of employees adversely affected.

Based on SEIU's experience of meeting the health and safety needs of its public and private sector members for many years, SEIU believes that most buildings have some type of air quality problem at one time or another. We have seen a range of buildings with problems, including private office buildings, hospitals, nursing homes, city halls, social service offices, state institutions, prisons, mixed use buildings like offices over parking garages, and community colleges.

(13)(a) Have these factors [psychosocial considerations, physical stressors such as temperature, lighting and noise and ergonomics] been considered in instances where IAQ investigations have failed to identify a specific contaminant source?

Most workers realize that many factors affect their well being at work, and do not blame all of their discomfort on poor indoor air quality. Workers know that other factors like ergonomics, light, noise, workload, and crowded work areas and materials are important to their quality of work life. These factors interact with indoor air pollution to produce adverse symptoms. Workers frequently will tolerate indoor air pollution, just as they put up with other occupational health and safety hazards, until a co-worker becomes seriously ill.

The "experts" often do not know what workers know. For

instance, IAQ investigators do not consider the above mentioned factors as contributing to worker discomfort or illness. The "experts" prefer factors that are scientifically measurable. Also, building managers and HVAC engineers are not responsible for factors such as ergonomics, workload, and crowding of materials, so they know nothing about them. Even "experts" who may be versed in these issues, like the employer's safety officer, do not attempt to address them, because they are not regulated by any government agency any more clearly than IAQ is.

Alternatively, the complaints about IAQ are blamed solely on these other factors. The IAQ complaint will not be seriously investigated, and the worker(s) will be labeled with psychological explanations like: "hates his job", "hates her boss", "anti-smoking fanatic", or "menopausal."

Workers would be better protected if they and the "experts" they depend on were better trained about indoor air quality. The person designated to solve air problems should have extensive training on the issue. Building service and maintenance workers should be trained in the basics, and all building occupants should receive information outlining symptoms, causes, and their rights.

(14) If your company keeps records of employee IAQ complaints, can you summarize your experience, emphasizing your efforts to localize the problem, identify the contaminants, determine the adverse health effects, and action taken?

Generally, employers do not have an organized system to respond to employee complaints. The following are typical scenarios of SEIU's experience in trying to protect its members from poor indoor air quality. They illustrate bureaucratic roadblocks workers and employers face when trying to improve indoor air quality.

1. Often, the first people called in to investigate claims of poor indoor air quality are the building manager and HVAC system manager. However, they may be unable to identify the sources of the problem, because they may not know enough about the issue, or the HVAC system is not the cause of the problem. The problem is then referred to the employer's safety office, or the Department of Health if the employer is public, who then "inspects" the building by taking air samples or looking for other physical evidence. The investigator may miss the source entirely, perhaps by testing for the wrong substance. When no major problems are found, the employer may make a few small changes without solving the problem. Because untrained people are often

called upon to solve indoor air quality problems, workers need the right to call a sufficiently trained person to respond to their complaints.

2. Often, the employer will call in an outside IAQ or HVAC consultant to investigate worker complaints. The consultant inspects the building, and gives recommendations. Some will be easy to implement, but others will cost thousands of dollars. The employer will implement the easy ones, but will stall on the expensive ones. In a unionized worksite, workers may file a grievance. Often the grievance takes years to be resolved through the arbitration process, and, in the meantime, the workers continue to breathe bad air. The arbitrator may not rule in the workers' favor, even though the problems have not been solved during the years long process. Because arbitrators sometimes do not know how to judge such cases, OSHA needs to create regulations that would give objective criteria to evaluate employers actions.

3. In one case, an employer hired a contractor to remove flooring during work hours. The contractor used a torch which created noxious fumes that irritated the office workers. After complaining to supervisors, the workers called Cal-OSHA. The inspector told the employer that torching of the floors was unsafe to do during working hours because of a potential fire hazard and blocked exits. The employer agreed and halted the floor work.

4. Sometimes, an employer has to be forced or embarrassed into solving indoor air quality problems. Workers can discuss the problems with management, file union grievances, have consultants give recommendations, and even have local political leaders call the employer, but never get the employer to agree to solve the problem. To protect their health, workers often need to get tough with their bosses. They need to call press conferences, plant embarrassing newspaper articles, and be interviewed on the local TV news before employers decide to make changes.

5. Poor air quality is often blamed on smokers. While second-hand smoke may contribute to a problem, it is poor ventilation that is the real cause of the problem. Workers are divided emotionally, smokers versus non-smokers, and a solution to poor indoor air quality is negotiated on the smoking issue alone. Then, improving the ventilation system is postponed until the smoking policy is given ample time to fail.

(23) What monitoring techniques other than ventilation rates do you use to measure indoor air quality in your workplace?

Any monitoring technique needs to be accompanied by surveys and interviews of workers, and ongoing logs of workers' symptoms. Workers can tell an investigator how the air quality affects them better than any other monitoring technique. Building occupants have the best firsthand knowledge about the air quality in all areas of the building, around the clock, and during all weather conditions.

Carbon dioxide testing is the most common method of determining if an adequate amount of fresh air is being introduced into the work area. There is a correlation between increasing levels of carbon dioxide and complaints about air quality. For example, at carbon dioxide levels below 600 ppm, few building occupants have complaints. At levels between 600 ppm and 1000 ppm, a greater number of occupants experience problems. At levels above 1000 ppm, many occupants experience physical problems and discomfort. A periodic review of the HVAC system is also important.

To monitor for specific substances, conventional industrial hygiene practice uses threshold limit values or other numerical indicators of a hazardous conditions. However, this method is not appropriate for dealing with air quality problems, because it ignores the cumulative and interactive impact of toxic materials and inadequate fresh air circulation.

(27) NIOSH has developed guidelines for IAQ investigations (NIOSH 1987). If your workplace has conducted investigations: (a) Did you try an approach different from NIOSH's in your investigation? (b) If yes, please explain how your approach differed from the NIOSH guidelines.

(a) In indoor air quality investigations of workplaces, SEIU uses criteria different from that of NIOSH.

(b) There are three basic indicators of poor indoor air quality that should be looked for in any investigation:

1. Complaints from building occupants and anecdotal evidence of poor indoor air quality coinciding with health symptoms associated with indoor air pollution.
2. A comprehensive survey of building occupants in which the results indicate that a significant number of building occupants share similar symptoms and

descriptions of poor air quality.

3. Physical evidence including accumulated dirt, dust or mold in the ventilation system; abnormal air handling unit noise; water damage on ceiling tiles; mold stains on carpets; and odors from the ceiling, carpet, furniture, air, or ventilation system.

(47)(a) If you do not follow the ASHRAE guidelines, do you believe one minimum acceptable CFM/person threshold exists for all indoor work environments which would successfully alleviate all health effects? (b) What would you recommend that level to be? Please provide supporting information.

Some state and local ordinances require low CFM to conserve energy. However, there are other ways to conserve energy besides limiting the amount of fresh air brought into a building. Energy conservation can be achieved by using a heat exchanger, purchasing more energy efficient building equipment like light fixtures, machinery, and office equipment, reducing internal noxious emissions to reduce the need for more fresh air, reducing internal heat output to reduce the need for air conditioning. Therefore, OSHA should explicitly override local rules which limit fresh air intake to less than the amount to be specified by OSHA:

An air quality standard should be based on more than just the CFM. The goal is delivery of fresh uncontaminated air to each workers' breathing zone, not just their work area. So, air flow patterns need to be considered in addition to the CFM. Additionally, using contaminant levels as the only indicator of air quality problems is also limiting. A combination of CFM, carbon dioxide readings, HVAC maintenance and other actions is necessary to reduce indoor air pollution.

(62) If smoking is allowed in indoor work areas, what should be done to assure that nonsmokers are protected from exposure to passive tobacco smoke?

Work areas within a building should be designated either as smoking or non-smoking. Non-smoking areas need to be enforced. Smoking areas should be physically separated and be ventilated directly to the outside to prevent second-hand smoke from passing to the non-smoking areas.

The rights of smokers and non-smokers alike should be protected. Smokers who work in non-smoking work areas should have access to smoking areas during work and lunch

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breaks. This is especially important when a work area changes from smoking to non-smoking. Free, high quality, smoking cessation programs at or near the worksite and on work time should be made available to workers who desire to quit smoking.

Workers who deal with the public are exposed to second hand smoke from clients and customers. In work areas where smoking by workers is limited or prohibited, the same rules must apply to the clients and customers. Race tracks are an industry where regulation is especially needed. Race track parimutuel clerks are restricted to certain areas for smoking, but they take bets from clients who smoke in their faces. The workers are not protected from second hand smoke, because there are no restrictions placed on the smoking public.

(63) In your opinion, should smoking control policies differ for different types of workplaces (e.g. factories, offices, stores, restaurants)? If your answer is yes, please state your reasons why you believe this.

Smoking policies to reduce nonsmoker exposure to second hand smoke should not differ based on the type of workplace. However, in workplaces where toxic or explosive materials are used, smoking policies need to be tailored to protect all workers from toxic exposure, fire, or explosion. Smoking in these workplaces needs to be restricted to prevent ingestion of toxics through the smoking process, and to prevent lit cigarettes and matches from interacting with flammable material.

(73) How effective have modifications in ventilation systems and IAQ monitoring been in reducing the number of related illnesses and complaints in your workplaces?

It is not uncommon for governments to purchase or lease buildings for office space that were never designed for such use. When office workers, equipment and furniture are put in such a building, indoor air quality problems often result. The buildings were not originally designed to accommodate large numbers of workers, public visitors, office partitions, or chemical fumes from office equipment and furniture.

An SEIU local union is working to solve the indoor air quality problems in a building originally built as a grocery store but now leased by a county social service department. The ventilation system was not modified, even though the building was crowded with office workers, furniture,

equipment, and social service clients. After a year of complaints of stuffy, smelly air and inadequate cooling, some actions were taken. The air ducts were cleaned to remove large amounts of accumulated dust and soot, and the motor on the ventilation was increased from one-half to three-quarters of a ton. These changes have improved the air quality somewhat. However, the HVAC system needs a complete overhaul, because the current system inappropriate to handle the current occupancy and building configuration.

(92) If OSHA determines, on the basis of adequate evidence, that regulatory action is needed to protect employees from adverse health effects related to indoor air quality, what elements do you believe such regulation should include.?

#### Outline for OSHA regulation

##### A. Identification

1. There should be an established procedure to record complaints and provide follow-up so that there is evidence of problems as they occur.
2. Testing should be conducted as appropriate for carbon dioxide, fresh air circulation, and toxic substances.
3. There should be an ongoing review of HVAC maintenance records, including cleaning of system components, changing filters and other operation procedures.
4. The HVAC system should be regularly inspected, including checking for contamination of drip pans, ductwork and intact vents.
5. A building chemical audit should take place to review all pesticides, cleaning and office equipment chemicals, HVAC lubricants, and all other chemicals brought into the building.
6. The results of all inspections, tests, and reviews should be readily available to all building occupants.
7. If air quality complaints are filed, surveyed should be conducted of all building occupants to determine prevalence of other problems or symptoms.

8. If building occupants have health problems associated with indoor air pollution, the health problems should be listed on the OSHA 200 log.
9. Appropriate procedures should be developed for airborne contagious diseases, like tuberculosis, if there is a reasonable possibility of exposure.

B. Education

1. Building occupants should receive awareness level training about indoor air pollution and health impacts.
2. HVAC operators need certification of adequate training to operate and maintain HVAC system.
3. Building owners and employers need operations overview training based on the new EPA looseleaf manual.

C. Organization

1. A person with appropriate training should be designated as the individual with responsibility to receive complaints, maintain records and manage HVAC operations for the building.
2. Criteria should be developed for qualified HVAC consultants, and their resumes and references should be disclosed to building occupants.

D. Abatement strategies

1. An ongoing program to use alternative less toxic chemicals and processes to reduce exposure should be established.
2. Areas where chemicals are used like print shops and photocopy room should be ventilated separately from the rest of the building.
3. HVAC system (filter and ductwork) should be regularly maintained.
4. OSHA should set standards for fresh air supply (short and long-term amounts) that override local ordinances that limit fresh air supply in order to conserve energy.

5. HVAC system should be operated any time the building is occupied, including when janitors and other off-hours workers are present.
6. Guidelines need to be developed on creating fair smoking policies and non-coercive smoking cessation programs.
7. Guidelines need to be developed to address temporary problems like toxic fumes from street paving, nearby building construction, and interior renovation.
8. Bake-out and other appropriate new building start-up procedures need to be developed.
9. Guidelines should be developed for pest management to reduce need for pesticide use and to develop policies to ensure application during low occupancy levels with ventilation system on.
10. Fresh air requirement should be increased for new or newly renovated buildings during their first 18 months.
11. General housekeeping procedures should be established for vacuuming, replacing rugs, cleaning pigeon debris, wet and dry dusting, etc.
12. Ventilation directly to the outside should be provided for areas where machinery, kitchens, or smokers are located.
13. Outside sources of air need to be free from microbial or chemical contamination.
14. Water leaks need to be repaired to reduce exposure to possible microbial contamination.
15. Relative humidity should be maintained between 35% and 50%.
16. Accumulation of stagnant water under cooling deck coils of air handling units needs to be prevented.
17. Additional filtration as needed to reduce exposure to microbial contamination should be provided.

Conclusion

The prevalence of indoor air pollution problems calls for concerted action by the federal government. The EPA spends less than \$13 million of their \$6 billion budget to deal with an occupational hazard that is, by their own estimation, costing the U.S. economy \$60 billion in lost productivity annually. As the agency charged with protecting workers from occupational health hazards, OSHA must protect workers from serious respiratory and other illnesses associated with indoor air pollution. A comprehensive regulation by OSHA is needed to protect workers. An OSHA regulation will also invalidate the typical response heard from employers and building owners that say that, because OSHA does not regulate indoor air quality, it therefore must not be a hazard.

Attachments

1. N.J. Safety & Health Standards for Public Employees, Standards for Indoor Air Quality.
2. Results of a Statewide Indoor Air Quality Survey Conducted by the Pennsylvania Social Services Union, SEIU Local 668.
3. Article on San Diego, CA School Board approach to pesticide use.
4. State of New Hampshire, Clean Indoor Air in State Buildings.
5. State of Maine, "An Act to Require State-Leased Buildings to Meet Certain Air Quality Standards."
6. Morbidity and Mortality Weekly Report, A Strategic Plan for the Elimination of Tuberculosis in the United States.
7. Testimony of Service Employees International Union Before the Subcommittee on Health and The Environment of The Energy and Commerce Committee, April 10, 1991.
8. Documents relating to IAQ problems at 170 Otis Stret, San Francisco, CA and the eight year effort to get them corrected.
9. Documents relating to IAQ problems at 1326 West Imperial Highway, Los Angeles, CA and the five year effort to get them corrected.
10. Documents relating to IAQ problems at Schmitz Hall, University of Washington, Seattle, WA, including results of a worker survey, and a memo of the costs of solving the problems.