



Office Building Safety and Health

Charles D. Reese



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DEDICATIONS

This book is dedicated to those employers and office workers who were working in the World Trade Center on September 11, 2001 and those others who are continuing to work diligently in the office building work environments throughout the United States with the resolve that they will emerge each day safe and healthy from their office building.

PREFACE

This book was developed to provide safety professionals, students, and employers with the basic tenets for the initiation of an occupational safety and health initiative for those responsible for safety and health within office buildings.

The intent of this book is to provide a blueprint for occupational safety and health for office buildings. With the bulk of the American workforce now housed in office buildings of some sort from one floor to skyscraper, the need has arisen to consider how best to protect workers in these types of workplace.

As you incorporate the major requirements of each chapter you will be well on your way toward building a successful and effective safety and health effort for your office building and your employees.

This book will encompass a total approach to the development of an office building safety and health initiative. This content will begin with planning, management, compliance and the nut and bolts of safety and health in the center. The final chapters will address the newest of issues related to safety and health in the office building. These chapters will address terrorism, violence, and security as related to the office-building environment.

This is a how-to-book not just an information-providing text. It will talk about how to write a program, how to identify hazards, how to involve workers and attain their cooperation. It will provide suggestions and tools to help you accomplish a safe and healthy office environment for your workforce. It will provide you a checklist, resources, and guidance for the myriad of topics covered.

If you view safety and health as an integral part of doing business in an office environment, you will find that the information contained in this book will be of benefit to you in achieving an even better bottom line since you will reap the financial benefits of placing a value on occupational safety and health. Other positive effects that will be attained are less human (worker) suffering, better overall morale, a positive commitment to your goals and objectives, a decrease in overall risk, and less liability.

Occupational safety and health at any workplace are always dynamic and fluid. You will never have a perfect safety and health initiative since it will always be evolving as your effort matures and changes with time. By using the content of this book you will have the foundation to address change when it is appropriate to do so. Thus, you will have an effective occupational safety and health effort for your office building environment.

ABOUT THE AUTHOR

For twenty-five years Dr. Charles D. Reese has been involved with occupational safety and health as an educator, manager, or consultant. In Dr. Reese's beginnings in occupational safety and health, he held the position of industrial hygienist at the National Mine Health and Safety Academy. He later assumed the responsibility of manager for the nation's occupational trauma research initiative at the National Institute for Occupational Safety and Health's (NIOSH) Division of Safety Research. Dr. Reese has had an integral part in trying to assure that workplace safety and health are provided for all those within the workplace. As the managing director for the Laborers' Health and Safety Fund of North American, his responsibilities were aimed at protecting the 650,000 members of the laborers' union in the United States and Canada.

He has developed many occupational safety and health training programs which run the gamut from radioactive waste remediation to confined space entry. Dr. Reese has written numerous articles, pamphlets, and books on related safety and health issues.

At present Dr. Reese is a member of the graduate and undergraduate faculty at the University of Connecticut, where he teaches courses on OSHA regulations, safety and health management, accident prevention techniques, industrial hygiene, and ergonomics. As professor of occupational safety and health, he coordinates the bulk of the safety and health efforts at the University and Labor Education Center. He is often called upon to consult with industry on safety and health issues and also asked for expert consultation in legal cases.

Also, Dr. Reese is the principal author of the *Handbook of OSHA Construction Safety and Health*, *Material Handling Systems: Designing for Safety and Health*, *Annotated Dictionary of Construction Safety and Health*, *Accident/Incident Prevention Techniques*, and *Occupational Health and Safety Management: A Practical Approach*.

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CHAPTER 1

INTRODUCTION



Typical high-rise office buildings.

Prior to the catastrophic events that occurred at the World Trade Center on September 11, 2001, little attention was given to the protection and safety of those within office buildings. As we look about us we see that office buildings are an integral part of the business world, as we know it today. These buildings, “people containers,” come in varied shapes and sizes. These office buildings range from the large skyscrapers of the cities, the corporate office complexes in industrial parks, the office buildings that are a part of manufacturing facilities, to the office buildings of very small companies. These office buildings may house from ten to the tens of thousands of workers.

As employees travel to their offices each day, their safety and health are of more concern to them than in the past. Employers and owners have a greater vested interest to provide safety and security to those employees in their office buildings. Office building safety, health, and security have become a timely and essential part of the business world today.

Although there are many types of work where the inherent hazards present a more deadly and dangerous situation than the office environment, the office environ-

ment presents enough hazards that it should not be overlooked. Granted the office environment is not a manufacturing operation with a myriad of large machines/equipment or production lines, nor is it a constantly changing environment like a construction worksite.

One aspect of these people containers is that a large number of individuals are packed in a small amount of space with limited egress and at times poor ventilation that makes people feel that they are in a confined space. I once read that the survival kit for a high-rise office building was a canary in a cage and a brick. If the canary succumbed, you would use the brick to break the window. (The use of a canary was an old mining trick to detect bad air.) But today we know that fires, explosions, chemical releases, and collapse are as much a hazard as if not more than bad ventilation. All of these situations can result in a catastrophic event.

There are other hazards faced by workers in office buildings, which may not cause death but could lead to injuries and illnesses that may either be acute or chronic. Granted most of the issues today are those related to ergonomic issues that result in sprains and strains from material handling, repetitive injuries from poorly designed workstations, and the psychological factors and stress-related events that impact the health and the well-being of employees.

Other hazards include workplace security, terrorism, and the threat of violence that must be addressed in office work areas just as much as in other types of workplaces.

The normal hazards of slips, trips, falls, poor housekeeping, burns, operating equipment caught by or between moving objects, strikes by falling objects and electrical shock all should be an integral part of an office environment's safety and health effort. The use of chemicals, exposure to biologicals such as mold, virus, and bacteria, and exposure to blood-borne pathogens such as AIDS and HVB that have the potential to cause acute and chronic disease in the workforce are not to be treated lightly.

Data for office building mortality and morbidity is not very good. OSHA does not require reporting of injuries and illnesses for most office types of operation. Thus, the only records available would have to come from the companies themselves and they are unlikely to provide these details. The only other entity that might have an idea of the frequency and severity of the illnesses and injuries that are occurring would be the company's workers compensation carrier (see Figure 1-1).

SAFETY AND HEALTH (MANAGING)

Safety and health start in the design of the building. If the applicable safety and health codes are not an integral part of the design then you are stymied from the start. Almost every design component has a safety factor attached to it. It might be what force the building would withstand, the fire protection within the building, the adequacies of egress, the provision of proper ventilation, and the overall habitability of the structure. These are some of the large items. Many small subtle features go into the design of office buildings (e.g., exit signage) that provide for safety and health. Other items that are not part of the building's structural design but are an integral part of the feeling of being safe would be the design and wiring of the security system for the building.

Once a building has been designed with safety in mind then planning for safe and healthy occupancy must be considered. This may include everything from



Figure 1-1. Not all office buildings are high-rises, but they still have the same inherent problems.

hygiene facilities to amount of space per worker. Owners and employers must work together to assure that the actual workplaces are as free from hazards as possible. Not only are we looking at those factors that could cause physical injury, but those that could produce acute or chronic health effects from short- or long-term exposure to such items as mold or waste water.

This office building is the employer's and worker's home away from home. Thus, it may need to be more livable than the actual workers' homes since they spend the most of their waking hours in office environments. Study after study indicates that in most cases a good (safe and health) work environment goes a long way toward fostering job satisfaction, high morale, and better productivity. At least this is the foundation for a productive workplace. On Dr. Abraham Maslow's hierarchy of needs, once the basic biological needs of food and shelter are met then security is the second most important need. Thus, providing a safe and healthy work environment is a giant step toward meeting this need of workers.

Once the physical environment is safe and healthy, does anyone really care about the workers' safety and health? This is where managing safety and health comes into play. It is not enough to espouse worker safety and health. It is imperative that the employer is committed to providing the leadership regarding occupational safety and health. Employers need to do more than talk a good talk since their actions will speak louder than their words. Safety and health needs to be part of the culture of the workplace. The employer and the workers should not tolerate an unsafe or unhealthy workplace.

Management of safety and health not only requires commitment and leadership support as a critical element. Another key factor has been shown to be employee involvement in fostering safety and health. As part of the management process, hazard identification, hazard intervention and prevention, and training must exist. Training is vital even in the office environment since workers need to know the company's policies, rules, hazards they are going to be exposed to, how to use equipment safely, what to do in an emergency, and their responsibilities related to safety and health at the company.

There is a real cost when owners and employers do not take safety and health seriously. Workers' compensation is integrally tied to workplace injuries and illnesses. It is a direct cost to a business when workers become ill or suffer an injury in their workplace. The more injuries the more the cost the employer will experience. The worker compensation system demonstrates the importance of prevention as a mechanism to hold down the cost of workers' compensation. The containment of worker compensation premiums is critical to a profitable business operation whether it be heavy industry or office-related work.

As an aid in developing a safety and health program in an office building, it is imperative the owners and employers be familiar with the workings of the Occupational Safety and Health Administration (OSHA). OSHA should not be viewed only from an enforcement perspective.

Although OSHA seldom conducts inspections or requires recordkeeping of office-related business operations, the workers are themselves covered by the regulatory authority of OSHA. Employers who have an office workforce may not have the inherent hazards faced by manufacturing or construction operations, but they do have to address the existing hazards which are present even though those hazards may not be as many, pervasive, or dangerous as those faced in other workplaces. Even though the danger is less for offices, it should not be assumed that offices are safe or free of health hazards since unsafe conditions can still exist and workers can always perform work in an unsafe manner or be exposed to potential chemical, biological, or physical hazards capable of causing injuries and health effects. OSHA is responsible for the safety and health of all workers; therefore, office-building employers need to be aware of OSHA's function, intent, and regulatory requirements.

THE HAZARDS (SAFETY)

At first glance it would seem that few hazards exist in an office environment that could lead to injuries or health effects, but this is just not the case (see Figure 1-2).

The hazards that can lead to injuries should be identified and relevant preventive techniques should be adhered to. The hazards could cause slips, trips, falls, burns, electrocutions, back injuries, sprains, strains, eye injuries, cuts, and bruises. These hazards range from walking/working surfaces to sharp cutting instruments. Employers and workers need to be on-guard related to these types of hazards.

Office equipment poses not only safety concerns but many have health hazard concerns. The mitigation or prevention of office equipment hazards and the development of safe operating processes and procedures should be undertaken to assure that no adverse effects are suffered by those working around and with the equipment. Workers should receive training on the safe use and operation of any tools or equipment that they will be using.

It may seem that housekeeping is not a subject unto itself. Housekeeping is a primary culprit in many accident and injury scenarios. Housekeeping has a direct impact upon the general functioning of an office and the potential for accidents to occur.

Many injury events in office buildings result from the handling of materials or actual lifting of materials. These can be some of the most expensive injuries. A single back injury has been reported to cost in the neighborhood of \$10,000. Employers should identify potential material handling hazards and discuss ways to mitigate the repercussions of these types of activities. Also, the material handling and



Figure 1-2. What could go wrong in this setting?

lifting equipment that can be used to assist in these activities will be identified and purchased as necessary.

HEALTH HAZARDS

The design of the layout of an office building can do much to either improve or contribute to the overall safety and health of the workforce. The selection of furniture, the use of natural lighting and its accessibility to workspaces, and convenience of design in providing proximity to accessory locations are often factors in the safety and health of workers within office buildings. The overall environment has the most effect on the health of workers. This includes many factors such as ventilation, noise, temperature, cleanliness, and the design of individual workspaces that can be adjusted to the uniqueness of the worker. This would be the fitting of the worker's office, cubicle, or area to accommodate the individual worker.

In today's office environment, no discussion on office safety and health would be complete without a discussion of the ergonomic hazards relevant to office tasks. This would not be just a discussion of computer workstations, although for most office workers, this would be an important factor. But it includes other factors such as

environmental and personal stress. Workers should be trained on the most common types of cumulative trauma disorders, their symptoms, and preventive actions that can be taken. A worker trained on ergonomic issues can go a long way toward prevention and early detection that can be a real cost savings. Although considered an injury rather than an illness, employers should take specific action to help mitigate the pervasive or infamous back injury.

Sick Building Syndrome is an infamous term in today's office world which can usually be linked to the ventilation system, but this is not always the case. When new wall or floor coverings are installed, the off-gassing of adhesives and materials may also be a culprit.

The term *office building environment* keys in specifically on indoor air quality, but it addresses other potential environmental factors such as noise, temperature, and illumination. It also implies the use of safety floor and wall coverings as factors that affect the office-building environment.

It must be realized that a single-employer office building is different than a multi-employer office building where each employer may be using chemicals that other employers do not know about. Standard procedures for the handling and storage of chemicals should be developed as well as ways to assure the consistency of communications to other employers regarding chemical hazards and the types of chemicals that could be found within the office building. Workers should be trained on how to react to chemical spills and should be provided guidance on the proper response and communication to others regarding the spill.

Many of the health issues in office buildings are related to chemicals that exist and are used, the ventilation system, other workers, construction/renovation activities and hygiene conditions. In office buildings any chemical used has the potential to be spread by the ventilation system to the whole building. Some of the equipment and chemicals used could possibly contribute to cancer or reproduction problems. The enclosed environment of an office building can contribute to health issues in such ways as chronic respiratory disease, allergic reactions, hypersensitivity, bacteria and virus infection, problems from molds, communicable diseases, chemical sensitivity, and stress-related disorders.

EMERGENCIES

All office buildings should have an emergency action plan and workers should be trained on it and its components. This type of preparation is the key to preventing a catastrophe. A written plan is a good start but is useless unless workers are trained on what to do in case an emergency transpires. The office building may require special attention in order to insure that it is in compliance with the plan itself.

Management must implement the plan and drill workers in its use for it to be effective (see Figure 1-3).

The number one office emergency is fire. Although emergency planning is vital to mitigating loss, prevention of fires especially in an office building with multiple floors, as most are, is almost as important as the fire evacuation planning. If the office building is designed to meet fire safety standards, fire alarms, fire suppression systems, and firefighting equipment are installed, and attention is paid to assuring the combustible materials do not accumulate, then much has been done to prevent fires and react to a fire at the earliest possible time. All the workers should be trained in the



Figure 1-3. This is the place for an evacuation plan but alas no plan was found.

use of fire extinguishers and be told what management expects them to do in case of a fire, whether to evacuate or try to fight the fire. Also, emergency numbers and evacuation routes should be posted in all work areas and areas of egress.

In most cases offices are usually in close proximity to emergency medical care but as a good safety and health practice, there needs to be basic first aid training and first aid kits available to the workforce. Most office buildings seem to disregard first aid as a nonessential item. It seems that everyone views first aid as a 911 call. Individuals trained in first aid and a well-stocked first aid kit are the first line of defense in heading off a more serious situation. If a cut can be treated quickly and effectively, then an infection two or three days later can be prevented. An effective first aid system needs to be in place within an office building with trained personnel and first aid kits easily assessable on each floor of the office building or in each company's office suite.

Office building maintenance becomes a very confusing issue at times and has an impact upon safety and health. The owner or employer may have his/her own maintenance crew. The owner or employer may contract out maintenance to one or more contractors. This becomes a safety and health control issue. The owner or employer can assure safe and healthy performance by his/her own employees, but often has far less control over contract employees who do not report to him/her.

Building maintenance is a key component of safety and health. The development of a preventive maintenance approach is superior to a reactionary one. In most workplace situations maintenance workers are often exposed to hazards not faced by others. This would especially be true of the office-building environment. Proper maintenance is critical to preventing the existence of hazards. The maintenance workers need special safety and health training as much or even more than other members of the workforce. Maintenance workers also can inadvertently expose office workers to potential hazards that are not normal for them to be concerned with. Thus, maintenance workers not only have responsibility for themselves related to safety and health, but to those who are in close proximity to their work.

At times office buildings have grounds surrounding them that fall under the jurisdiction of maintenance. This requires the use of mowing equipment, gardening tools, movement of materials, and the use of fertilizers and pesticides. This may also include the care of driveways and sidewalks that need repair or clearing during inclement weather conditions. These are different tasks and the individuals doing them should have training in order to ensure that they are done in a safe manner. The application of chemicals to the grounds around a building must be done safely and done in a manner that will not endanger the office workforce using the grounds.

Office buildings must have enough sanitary facilities to meet the needs of the workforce. For hygiene purposes these facilities should be well maintained and cleaned daily. Those who have responsibility for cleaning hygiene facilities should take special precautions including the universal precautions for the prevention of blood-borne pathogens (Hepatitis B and AIDS). These individuals should have specific training to perform their custodial function in a safe and healthy manner. Again there may exist an employee or a contractor relationship with the employer or owner, and proper procedures and processes must be followed in order to protect the workforce and custodial staff from injury and disease where hygiene facilities exist or hygiene work is being performed.

There are times when office buildings must be renovated or construction activities need to be performed. Not only are those doing the renovation or construction at risk of injury and illnesses, but the office workers within the building are subjected to many of the same hazards as those performing the renovation or construction tasks.

During periods of renovation and construction activities, these workers bring into the office building or create new hazards that had not previously existed. These construction activities result in the workers involved bringing tools, chemicals, and materials into the office building, which are foreign to the office workforce. These activities create walking, housekeeping, noise, dust, chemical, and odor hazards that could affect the existing office work areas even though the construction work area has been barricaded or isolated to prevent entry. Special attention must be given to insure a safe and healthy work environment if the office workers are to remain in the building during these renovations or construction activities.

SECURITY

Security has become the issue of the day and it appears to be much more of a problem in office buildings where those attempting to breach the building have themselves a captive audience inside. Although there are no guarantees, security upgrades, if necessary, should be a priority item.

In today's world, workplace security is of high concern to employers and the workforce. One cannot expect workers to be highly productive if they do not have a sense that they are well protected. Much can be done with modern access devices and surveillance tools to maintain a secure workplace. Employers and building owners need to employ state-of-the-art security techniques and devices to insure safety of the workforce (see Figure 1-4).

Office building employers and owners must be more aware of the issues regarding the exposure of the workforce to nuclear, biological, and chemical weapons that could be launched by terrorists or those seeking to inflict damage and chaos in an office building. A closer look at ways that office buildings can be better designed, managed,



Figure 1-4. The security guard is the first line of defense.

and secured to prevent these types of issues is important to the security for those within the office building.

Office workers must also be secure as they come and go from their building. Providing a safe parking area is an issue faced by owners and employer alike. The provisions for worker security going to and from the parking area and within the parking area must be undertaken. Many techniques can be employed such as escorting, limited access, and surveillance cameras for those using the parking areas. Although this is usually outside the building, it still is part of the company's venue and workers should feel as secure and safe in parking areas as in their offices.

In the close quarters of an office setting tempers often flare. Where you have people you have the potential for conflict, which could lead to violent situations. Employers must take this as a serious matter today and have a plan and policies in place for handling potential violent situations. The workforce needs to be aware of the ground rules set by the company and take seriously any potential threats by following the company procedures for such situations. Workplace violence is a real issue in all workplaces and the office workplace is no exception.

SUMMARY

It is a far easier task to coordinate safety and health in a corporate office building since all supervisors and workers fall under the same management plan. In a multi-employer office building where a variety of companies may be on the same floor or companies occupy one or many floors in the building while other companies may be on other floors, the assurance of safety and health becomes a much more complicated situation.

All of the topics highlighted in this chapter will be discussed more fully in the chapters to follow. The emphasis will be on managing, hazard identification, and hazard prevention, and their impact on both safety and health as critical elements in making an office building safe, healthy, and secure.

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CHAPTER 2

PLANNING OFFICE BUILDING SAFETY AND HEALTH



Planning for safety and health begins with the plans of the architect and the construction process.

A safe and healthy office building is not something that just happens by itself or by magic. It must be carefully planned and orchestrated from the beginning of the design. The hard issue to grapple with is that it is a never-ending process. Since each time some facet of the building, its operation, or its occupants change, new issues arise regarding safety and health within the structure. The owner of the building will set the tone for the safety and health of his/her office building. The employers who occupy it if different from the owner will have to assume the responsibility for their employees. This planning is a dynamic process that should be approached in a serious manner in order to provide a safe office building from conception (construction) to grave (demolition).

DESIGNING SAFETY

The designing of safety and health starts with the architectural plans. All the safety and health design factors that have been learned over the years and have become required or regulated must be incorporated. This includes such items as safe stairway design, fire protection, fire suppression systems (sprinklers), floor loading capacities, prewired emergency alarms, adequate ventilation for the occupancy capacity, plans for security, well-defined escape ways, safe storage areas for chemicals, etc., use of safe insulation materials, shatterproof glass, non-slip floor coverings, fire-proof building materials, adequate floor area for occupancy, properly installed elevators, properly installed wiring, and a host of many other items too numerous to mention.

There are standards that should be adhered to for buildings that will have workers occupying them. There are organizations that have requirements that should be followed in the construction and design of your building. Listed below are some of these standard- or information-producing organizations:

- National Fire Protection Association (NFPA).
- National Electric Code (NEC).
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE).
- American National Standards Institute (ANSI).
- American Society for Testing and Materials (ASTM).
- Underwriters Laboratories (UL).
- Building Owners and Managers Association (BOMA).

The above entities develop standards or guidelines for fire safety, electrical safety, air quality, emergency preparedness, air quality issues, anti-terrorism, materials, equipment, and other devices.

As part of the design process, you should make sure that you have addressed the needs of those with disabilities. The Americans with Disabilities Act (ADA) mandates a certain degree of accommodation for employees and the public. Your effort to install ramps, wheelchair accessible doors, handicapped hygiene facilities, Braille for those who are sight impaired, and emergency strobe lights for those who are hearing impaired are examples of your desire to comply and provide for the needs of the disabled (see Figure 2-1). It is far less expensive to include providing for the disabled during the design phase than retrofitting after a building has been completed.

If you do not feel that you have the expertise to address issues involving the safety, health, and security of your new office building, do not hesitate to solicit expert consultation. This is certainly the best time to accomplish this with minimal cost. Anything retrofitted after the building has been built will cost more than incorporating it into the design as you begin the building process.

Once you have addressed all potential safety, health and security issues in the design process then you must move on to assuring that safety and health are addressed as part of the construction process.



Figure 2-1. Design of the necessities for the disabled, such as this ramp, is an important step.

PLANNING FOR THE CONSTRUCTION PHASE

Prior to the construction phase of your office building, the selection of the general contractor and subcontracts is critical. These are the individuals who are going to build your office building. You want to make sure that they will build according to specification, use the proper materials, enforce the safety and health of their workforce, and adhere to the contract and timetables. As a part of evaluating and selecting your general contractor, you should ask to see their written safety and health program, a summary of their occupational injuries and illnesses for the past three to five years, and check to see if their workers' compensation experience modification rate (EMR) is below 1. You might also ask for references regarding not only construction performance but safety and health performance that you can contact. Any contractor who fails to produce references should be viewed with a suspect eye. Thus, this selection process is critical to you to have a safe and healthy office building (see Figure 2-2).



Figure 2-2. Many activities transpire in construction that could result in hazardous situations.

If the building is built to your specification then you can be assured that the safety and health aspects that were part of the design are built into it. If you have a general contractor who does not pay attention to the safety and health performance of his workforce and subcontractors, you may experience delays, overruns, and shoddy work being accomplished. Not only is poor safety performance costly in the workers' compensation and medical costs, but it also has an overall affect on the following:

- Increased insurance cost.
- Fewer compliance issues if inspected by OSHA.
- Increases public's poor perception of the project.
- More litigation issues.
- More loss of skilled workers to injury, illness, or death.
- More long-term disabling incidents.
- Lower worker morale.
- Decrease in production.
- Loss of time due to ineffective use of supervisors' time.
- Greater turnover, replacement workers, or new team building.

Before releasing the general contract from the project, you should have a third party conduct an inspection on the:

- Degree of compliance with the design requirements.
- Degree of compliance with the construction and materials used.
- Degree of installation of safety and health predesigned features.
- Degree of completeness.
- Items that need to be finished prior to release.

You might want this to be a team that conducts this inspection since no one individual has the expertise to address all the complex issues of this inspection. Safety and health should not stop with the completion of construction. The purchases that you make to place in the office building should be done with safety and health in mind.

PURCHASING SAFETY

It is really not possible to buy safety. But, the use of good purchasing practices should be an integral part of planning safety and health for your office building. What this means is that you consider the impact and contributions that purchases have on providing a safe and healthy office environment.

You need to insure that all your purchases are made with occupant safety and health in mind, making sure that each item purchased is the safest product available to protect the workforce in your office building. A reminder of the items that are purchased that have to do with safety and health in your office building is provided below but this is not a complete list. They are as follows:

- Appropriate lighting.

- Replacement materials.
- Replacement fixtures.
- Emergency equipment and systems.
- Security systems.
- Ergonomic and well-made furniture.
- Safe (UL approved) appliances.
- Safe and quality tools designed with ergonomics in mind.
- Approved equipment (office, maintenance, grounds).
- Proper personal protective equipment.
- Quality machinery.
- Cleaning equipment (buffers, vacuums, etc.).
- Complete first aid kits.
- Appropriate fire extinguishers.
- Safest chemicals (cleaning and maintenance).

It may not be worth your money to buy the cheapest items in the list above since inefficiency and unsafe purchases may cost you more in the long run in replacement, damage to property, and injury or illness to the workforce. This could lead to higher insurance rates, elevated medical costs, and litigation, all of which may be more costly than buying right the first time (see Figure 2-3).



Figure 2-3. Note the quality of the materials and furnishings being used make for a far safer commons area.

You might set up a group to evaluate purchases or at least ask supervisors and workers for guidance on purchasing. For the reason mentioned previously it is not wise to give purchasing responsibilities to a single person and tell him or her to buy cheap. You must set controls for your purchasing activities so that safety and health of the workforce become a part of the process.

YOUR ROLE IN SAFETY AND HEALTH

In planning safety and health from your perspective you must set the example by your management approach. You should have a written safety and health program with policies and rules, which you yourself never violate. You are the role model for safety and health and thus must, by your words and actions, exhibit safety and health as an integral part of your business philosophy. Never walk by an unsafe condition expecting someone else to take care of it or turn a blind eye to an unsafe act by someone. If you do not mention it and correct the behavior, others and the perpetrator will assume that it is the behavior that you expect. Develop consequences for anyone violating good safety and health practices. It might begin with a warning or written warning in personnel files, to time off or a full dismissal. If safety and health are enforced in the office building then it will become part of the culture that safety and health are important in this office building. So make sure that you:

- Have a written safety and health program.
- Have a budget for safety and health.
- Support safety and health by your actions as well as words.
- Identify unsafe conditions and acts and intervene to stop them.
- Have a discipline policy for those who violate safety and health rules and policies.
- Look for ways to enhance and reinforce your safety and health initiative.

You must develop a plan for how you will hold the new occupants accountable for safety and health within their office areas.

SELECTING OCCUPANTS

In this planning process you are actually creating a new safety, health, and environmental culture. Culture is the ideas, customs, values, norms, attitudes, commitments, and behaviors of a group of individuals in a given period or location.

You have the opportunity to create the culture of the workforce that will occupy your building related to occupational safety and health. Your first step will be to create a vision for the safety and health culture that you would like to see. Secondly, create expectations, objectives, and goals to achieve the vision. Third, you will want a way of measuring the degree of attainment of safety and health of the occupants.

Any occupants to whom you rent in an office building should be required to demonstrate their commitment to your safety and health objectives and goals. You should require them to:

- Develop a written safety and health program.
- Be involved in your purchase of safe process.
- Have someone designated to be responsible for safety and health.
- Report and provide a report on any accident that occurs in their rented area.
- Enforce your safety and health policies and rules.
- Participate in any emergency or fire drills.
- Measure their safety and health performance.

You need to track the safety, health and environmental performance of occupants in your office building. Adequate safety and health performance can be accomplished by tracking reported accidents, independent inspections, and a personal walk-through of the office building.

As part of your contract, you should have a section on the requirements for occupational safety and health. As a part of this section, you should retain the right to evict any occupant or worker who violates the safety and health policies and rules. Again, this is another statement regarding how important safety and health are to you and the degree of support that you give it.

SUMMARY

Planning for safety is a critical element in assuring that worker safety and health are an integral part of the overall operation of the office building. The main objectives for this planning should include the following:

- Determining leadership commitment to safety, health, and the environment.
- Identifying critical safety, health, and environmental issues.
- Creating of a shared safety, health, and environmental vision and public identity.
- Developing the mission and direction to realize this vision.
- Developing objectives to address the issues.
- Setting of specific, measurable, and time-phased goals for the accomplishment of the objectives.
- Developing strategies to accomplish these goals.
- Determining a unified safety, health, and environmental internal and external public identity for the company.
- Creating of qualitative and quantitative criteria for the measurement of safety, health, and environmental performance.
- Determining an appropriate acknowledgement system for goal accomplishment.
- Determining subsequent steps for continuing and completing this process.

The planning for environmental/occupational safety and health is an ongoing and dynamic process that will be evolving constantly and needs to be attended to on a regular basis. This is the reason that safety and health must be managed like any of the other business functions for your office building. Failure to manage it will result in the loss of control of the safety and health function.

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CHAPTER 3

MANAGING OFFICE BUILDING SAFETY AND HEALTH



It takes people to manage office building safety and health.

Managing the safety and health functions should be accomplished like any other aspect of doing business. First, management is ultimately accountable and responsible for its workforce's safety and health on the job. A key to having an effective safety and health effort is the implementation of the many facets of management techniques for safety and health, the least of which is planning and having an organized approach. It is imperative that you must identify your problem areas (hazards) and make an honest effort to address them or control them in some way.

It should be apparent to you that everyone has a role to play that is relevant to occupational safety and health. An atmosphere of genuine cooperation with regards

to safety and health must prevail. The welfare of those working in your office environment must be the common theme that everyone can support. You certainly want everyone to go to their homes after work with the same number of fingers and toes and not feeling as though they are ill.

What the above paragraph is saying is that it is paramount that everyone be involved in ensuring that the workplace is safe, healthy and free from hazards that might make him or her sick or cause physical harm. This goal cannot be accomplished by management or supervisors on their own. It must involve those who are performing the work. After all, who knows the most about the work they have been assigned to accomplish and especially the dangers of doing their job than the employees themselves?

You need to address all of the many facets of developing and implementing a functional safety and health effort. All safety and health management techniques need to be addressed as an integral part of the overall safety and health approach employed at your workplace. This includes the process, techniques, and the people side of managing safety and health.

It is imperative when addressing safety and health that you really mean what you say and you support your efforts by every action, word, and deed. If you drop the ball on any part of your support for safety and health the perception will exist that you have given only lip service to safety and health and really do not care about your workforce.

Employees/workers need to feel that they are of value to their employers. How many companies do you know who say, "Our employees are our most valuable asset," but their actions do not convey that message? Certainly it is a sacrifice both in personal effort and resources to make others believe that you really do care. So many in management drop the ball, trip, fall and fail to really support the "value employee" message on this one most important issue. In surveys done recently, employees in workplaces stated that the most important aspect of their job to them was to be treated with respect and as a valued employee. These desires were evaluated as being a statistically representative answer for this population. If any of us would venture a guess about what the results of such a survey would be at our own workplaces, surely they would be identical.

PRINCIPLES OF MANAGEMENT

Those managing safety and health should adhere to the following basic principles.

1. **Management is ultimately responsible for occupational safety and health.**
Thus the need for commitment, budgeting and planning for safety falls upon management's shoulders.
2. **Poor safety conditions and safety performance by the workforce result from management's failure to effectively manage workplace safety and health.**
Accidents and incidents result from management's inability to manage safety and health as they would any other company function.

3. **Worker and supervisor involvement are critical to good workplace safety and health.**
A workforce who is not involved in safety and health has no ownership and thus feels no investment, responsibility, or accountability for it.
4. **Workplace safety and health is not a dynamic, quickly evolving component of the workplace since it should go hand in hand with your normally evolving business.**
In safety and health there is little which is new since we know the causes of occupational injuries and illnesses as well as how to intervene, mitigate, and prevent their occurrence. There should be no excuses for accidents and incidents since the philosophy should be that all are preventable.
5. **You cannot have an effective safety and health program without specifically holding the first line supervisors accountable for their and their employee's safety and health performance (as well as other management personnel).**
First line supervisors are the key to the success or failure of a safety and health program. All your planning, budgeting, and goal setting are for naught if the supervisors are not accountable and committed to safety and health.
6. **Hazard identification and analysis are critical functions in assuring a safe and healthy work environment.**
If management and the workforce do not tolerate the existence of hazards and constantly ask the question, "How could this have happened?" they are better able to get to the basic causes of adverse workplace events.
7. **Management's philosophy, actions, policies, and procedures regarding safety and health in the workplace should not put workers into situations where they must disregard good safety and health practices in order to perform their assigned task or work.**
Workers in most cases perform work in an unsafe or unhealthy manner when they have no choice or are forced to do so by existing conditions and expectations.
8. **It is critical to obtain safe and healthy performance or behavior by effective communications and motivational procedures that are compatible with the culture of your workforce.**
If you do not understand what it is that fulfills the needs of your workforce, you will not be able to communicate or motivate them regarding safety and health outcomes no matter how good your management approach.

SAFETY AND HEALTH PROGRAM

A key to formalizing the management of safety and health in a workplace is the safety and health program. Many feel that written safety and health programs are just more paperwork, a deterrent to productivity, and nothing more than another bu-

reaucratic way of mandating safety and health on the job. But over a period of years, data and information have been mounting in support of the need to develop and implement written safety and health programs for all workplaces.

This perceived need for written programs must be tempered with a view to their practical development and implementation. A very small employer who employs one to four employees and no supervisors in all likelihood needs only a very basic written plan, along with any other written programs that are required as part of an OSHA regulation. But, in large office environments where the number of employees increases, the owner/employer becomes more removed from the hands-on aspects of what now may be multiple floor, office complexes or different types of worksites in the office building.

Now you must find a way to convey support for safety to all those who work in the same office building. As with all other aspects of business, the employer must plan, set the policies, apply management principles, and assure adherence to the goals in order to facilitate the efficient and effective completion of projects or work. Again, job safety and health should be managed the same as any other part of the office building's business.

The previous paragraph simply states that in order to effectively manage safety and health, an owner/employer must pay attention to some critical factors. These factors are the essence in managing safety and health on worksites. The questions that need to be answered regarding managing safety and health are:

1. What is the policy of the owner/employer regarding safety and health in the office building?
2. What are the safety and health goals for the owner/employer?
3. Who is responsible for occupational safety and health?
4. How are supervisors and employees held accountable for job safety and health?
5. What are the safety and health rules for the office building environment?
6. What are the consequences of not following the safety rules?
7. Are there set procedures for addressing safety and health issues, which arise in the office building?
8. How are hazards identified?
9. How are hazards controlled or prevented?
10. What type of safety and health training occurs? And, who is trained?

Specific actions can be taken to address each of the previous questions. The written safety and health program is of primary importance in addressing these items. It seems apparent that in order to have an effective safety program, at a minimum, an owner/employer must:

- Have a demonstrated commitment to job safety and health.
- Commit budgetary resources.
- Train new personnel.
- Insure that supervisors are trained.

- Have a written safety and health program.
- Hold supervisors accountable for safety and health.
- Respond to safety complaints and investigate accidents.
- Conduct safety audits.

Other refinements can always be part of the safety and health program, which will help in reducing workplace injuries and illnesses. They are: more worker involvement (for example, joint labor/management committees); incentive or recognition programs; outside help from a consultant or safety association; and setting safety and health goals.

A decrease in occupational incidents that result in injury, illness, or damage to property is enough reason to develop and implement a written safety and health program.

Reasons for Having a Safety and Health Program

The three major considerations involved in the development of a safety program are:

1. **Humanitarian**—Safe operation of workplaces is a moral obligation imposed by modern society. This obligation includes consideration for loss of life, human pain and suffering, family suffering and hardships, etc.
2. **Legal obligation**—Federal and state governments have laws charging the employer with the responsibility for safe working conditions and adequate supervision of work practices. Employers are also responsible for paying the costs incurred for injuries suffered by their employees during their work activities.
3. **Economic**—Prevention costs less than accidents. This fact has been proven consistently by the experiences of thousands of workplaces. The direct cost is represented by medical care, compensation, etc. The indirect cost of four to ten times the direct cost must be calculated, as well as the loss of wages to employees and the reflection of these losses on the entire community.

All three of these are good reasons to have a health and safety program. It is also important that these programs be formalized in writing, since a written program sets the foundation and provides a consistent approach to occupational health and safety for the company. There are other logical reasons for a written safety and health program. Some of them are:

- It provides standard directions, policies, and procedures for all company personnel.
- It states specifics regarding safety and health and clarifies misconceptions.
- It delineates the goals and objectives regarding workplace safety and health.
- It forces the company to actually define its view of safety and health.

- It sets out in black and white the rules and procedures for safety and health that everyone in the company must follow.
- It is a plan that shows how all aspects of the company's safety and health initiative work together.
- It is a primary tool of communication of the standards set by the company regarding safety and health.

Written safety and health programs have a real place in modern safety and health practices not to mention the potential benefits. If a decrease in occupational incidents that result in injury, illness, or damage to property is not reason enough to develop and implement a written safety and health program, the other benefits from having a formal safety and health program seem well worth the investment of time and resources. Some of these are:

- Reduction of industrial insurance premiums/costs.
- Reduction of indirect costs of accidents.
- Fewer compliance inspections and penalties.
- Avoidance of adverse publicity from deaths or major accidents.
- Less litigation and fewer legal settlements.
- Lower employee payroll deductions for industrial insurance.
- Less pain and suffering by injured workers.
- Fewer long-term or permanent disability cases.
- Increased potential for retrospective rating refunds.
- Increased acceptance of bids on more jobs.
- Improved morale and loyalty from individual workers.
- Increased productivity from work crews.
- Increased pride in company personnel.
- Greater potential of success for incentive programs.

Building a Safety and Health Program

The length of such a written plan is not as important as the content. It should be tailored to the company's needs and the health and safety of its workforce. It could be a few pages or a multiple page document. In order to insure a successful safety program, three conditions must exist. These are: management leadership, safe working conditions and safe work habits by all employees. The employer must:

- Let the employees know that he or she is interested in safety on the job by consistently enforcing and reinforcing safety regulations.
- Provide a safe working place for all employees; it pays dividends.
- Be familiar with federal and state laws applying to the operation.
- Investigate and report all OSHA-recordable accidents and injuries. This information may be useful in determining areas where more work is needed to prevent such accidents in the future.

- Make training and information available to the employees, especially in such areas as first aid, equipment operation, and common safety policies.
- Develop a prescribed set of safety rules to follow, and see that all employees are aware of the rules.

Other Required Written Programs

Many of the OSHA regulations have requirements for written programs that coincide with the regulations. This may become a bothersome requirement to many within the workplace, but the failure to have these programs in place and written is a violation of the regulations and will result in a citation for the company. At times, it is difficult to determine which regulations require a written program but, in most cases, the requirements are well known. Some of the other OSHA regulations that require written programs are:

1. Process Safety Management of Highly Hazardous Chemicals.
2. Bloodborne Pathogens/Exposure Control Plan.
3. Emergency Action Plan.
4. Respirator Program.
5. Lockout/Tagout/Energy Control Program.
6. Hazard Communications Program.
7. Fall Protection Plan.
8. Confined Space “Permit Entry” Plan.

The specific requirements for the content of written programs vary with the regulation.

OSHA Guidelines for a Safety and Health Program

Although federal regulations do not currently require employers to have a written safety and health program, the best way to satisfy OSHA requirements and reduce accidents is for employers to produce one. In addition, distributing a written safety and health program to employees can increase employee awareness of safety and health hazards while, at the same time, reduce the costs and risks associated with workplace injuries, illnesses, and fatalities.

Federal guidelines for safety and health programs suggest that an effective occupational safety and health program must include evidence of:

1. Management commitment and employee involvement are complementary. Management commitment provides the motivation force and the resources for organizing and controlling activities within an organization. In an effective program, management regards worker safety and health as a fundamental value of the organization and applies its commitment to safety and health protection with as much vigor as to other organizational purposes. Employee involvement provides the means through which workers develop and/or express their own commitment to safety and health protection, for themselves and for their fellow workers.

- 2. Worksite analysis involves a variety of worksite examinations, to identify not only existing hazards but also conditions and operations in which changes might occur to create hazards. Unawareness of a hazard which stems from failure to examine the worksite is a sure sign that safety and health policies and/or practices are ineffective. Effective management actively analyzes the work and worksite to anticipate and prevent harmful occurrences.
- 3. Hazard prevention and control are triggered by a determination that a hazard or potential hazard exists. Where feasible, hazards are prevented by effective design of the job site or job. Where it is not feasible to eliminate them, they are controlled to prevent unsafe or unhealthful exposure. Elimination or control is accomplished in a timely manner, once a hazard or potential hazard is recognized.
- 4. Safety and health training addresses the safety and health responsibilities of all personnel concerned with the site, whether salaried or hourly. It is often most effective when incorporated into other training about performance requirements and job practices. Its complexity depends on the size and complexity of the worksite, and the nature of the hazards and potential hazards at the site. All training should be documented by the employer. You might use a form similar to the one found in Figure 3-1.

INDIVIDUAL WORKER’S TRAINING FORM*

WORKER’S NAME_____SOC. SEC. #_____

CLOCK NUMBER_____

Subject:	Date:	Length of Training	Instructor	Worker’s Signature
New Hire Orientation				
Hazard Communications				
Workplace Violence				
Security				

*Keep this form in the employee’s personnel file

Figure 3-1. Employee training documentation form.

Safety and Health Program Elements

If a representative from the Occupational Safety and Health Administration (OSHA) visits a workplace he or she will evaluate the safety program using the elements listed above. The compliance officer will review the previous items to assess the effectiveness of the safety and health program. Of course you are not held to only these elements of your safety and health program. You might want to address accountability and responsibility, emergency procedures, program evaluation, firefighting, or first aid and medical care. This is your program, designed to meet your specific needs. These can be addressed in add-on sections. You will find that your fines for OSHA violations can be reduced if you have a viable written safety and health program that meets the minimum OSHA guidelines for safety and health programs.

The composition or components of your safety and health program may vary depending on the complexity of your operations. They should at least include:

- Management's commitment to the safety and health policy.
- Hazard identification and evaluation.
- Hazard control and prevention.
- Training.

Of course, each of these may have many sub-parts that address the four elements in some detail. The safety and health program that you develop should be tailored to meet your specific needs. It is now up to you to develop and implement your own effective safety and health program. You can build a more comprehensive program or pare down the model to meet your specific needs.

In summary, "management commitment and leadership" includes a policy statement that should be developed and signed by the top person in the company. Safety and health goals and objectives should be included to assist with establishing workplace goals and objectives that demonstrate the company's commitment to safety. An enforcement policy is provided to outline disciplinary procedures for violations of the company's safety and health program. This safety and health plan, as well as the enforcement policy, should be communicated to everyone on the jobsite. Some of the key aspects found under the heading, "management commitment and leadership," are:

1. Policy statement: goals established, issued, and communicated to employees.
2. Program should be revised annually.
3. Participation in safety meetings; inspections; safety items addressed in meetings.
4. Commitment of resources is adequate in the form of budgeted dollars.
5. Safety rules and procedures incorporated into jobsite operations.
6. Procedure for enforcement of the safety rules and procedures.
7. Statement that management is bound to adhere to safety rules.

"Identification and assessment of hazards" includes those items that can assist you with identifying workplace hazards and determining what corrective action is necessary to control them. Actions include jobsite safety inspections, accident investigations, and meetings of safety and health committees and project safety meet-

ings. In order to accomplish the identification of hazards, the following should be reviewed using:

1. Periodic site safety inspections involving supervisors.
2. Preventative controls in place (PPE, maintenance, engineering controls).
3. Actions taken to address hazards.
4. An established safety committee, where appropriate.
5. Documented technical references available.
6. Enforcing procedures implemented by management.

The employer must carry out an initial assessment and then reassess as often, thereafter, as necessary to ensure compliance. Worksite assessments involve a variety of worksite examinations to identify, not only existing hazards, but also conditions and operations where changes might occur and create hazards. Being aware of a hazard, which stems from failure to examine the worksite, is a sure sign that safety and health policies and/or practices are inadequate. Effective management actively analyzes the work and worksite, to anticipate and prevent harmful occurrences. Worksite analysis is intended to assure all hazards are identified. This can be accomplished by:

1. Conducting comprehensive baseline worksite surveys for safety and health and periodically doing a comprehensive updated survey.
2. Analyzing planned and new facilities, processes, materials, and equipment.
3. Performing routine job hazard analyses.

“Hazard prevention and controls” are triggered by a determination that a hazard or potential hazard exists. Where feasible, hazards are prevented by effective design of the jobsite or job. Where it is not feasible to eliminate them, they are controlled to prevent unsafe and unhealthful exposure. Elimination of controls is to be accomplished in a timely manner, once a hazard or potential hazard is recognized, that all current and potential hazards, however detected, are corrected or controlled in a timely manner. Procedures should be established using the following measures:

1. Engineering techniques where feasible and appropriate.
2. Procedures for safe work which are understood and followed by all affected parties, as a result of training, positive reinforcement, correction of unsafe performance, and, if necessary, enforcement through a clearly communicated disciplinary system.
3. Provision of personal protective equipment.
4. Administrative controls, such as reducing the duration of exposure.

The employer must ensure that each employee is provided “information and training” in the safety and health program. Each employee exposed to a hazard must be provided information and training in that hazard. Note: Some OSHA standards impose additional, more specific requirements for information and training. The employer must provide general information and training on the following subjects:

1. The nature of the hazards to which the employee is exposed and how to recognize them.

2. What is being done to control these hazards?
3. What protective measures must the employee follow to prevent or minimize exposure to these hazards?
4. The provisions of applicable standards.

The employer must provide specific information and training:

1. New employees must be informed and properly trained, before their initial assignment to a job involving exposure to a hazard.
2. The employer is not required to provide initial information and training for which the employer can demonstrate that the employee has already been adequately trained.
3. The employer must provide periodic information and training as often as necessary to ensure that employees are adequately informed and trained and to be sure safety and health information and changes in workplace conditions, such as when a new or increased hazard exists, are communicated.

Safety and health training addresses the safety and health responsibilities of all personnel concerned with the site, whether salaried or hourly. The employer must provide all employees who have program responsibilities with the information and training necessary to carry out their safety and health responsibilities.

A model written safety and health program can be found in Appendix A. This model should be taken and adapted to fit the needs of your company.

SUMMARY

The management of safety and health is well recognized as a vital component by those who have responsibility for workplace safety and health. It is not just a written proclamation or program, but a true and supported endeavor to provide a safe and healthy workplace for workers. It must be as well planned and organized as any other facet of the company's business. Managing safety and health is critical to be able to provide the protections that a workforce within an office building is entitled to and deserves. This management process will probably go much better if you have a person, who by training and/or experience, can take the responsibility for the development of the safety and health effort in your office environment, but someone must do it if you are to have a safe and healthy office environment. Thus, office building safety must be planned, organized, and implemented in a business manner in order for it to be successful in assuring that an office building is safe, healthy, and secure.

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CHAPTER 4

WORKER INVOLVEMENT



Safety and health is everybody's business.

In recent years both the Occupational Safety and Health Administration and employers have come to realize that worker involvement is crucial in the conduct of an effective safety and health effort in the workplace. True worker involvement is a mechanism that can assure commitment and buy-in by the workforce. Involvement can be a part of the office-building environment and foster the kind of safety culture that goes a long way toward prevention of bad safety and health practices in the office workplace.

Worker involvement is a very strong motivator for individuals in the workplace. It provides them with a say, some control, personal participation, and acknowledgement that they can contribute. All of these factors are very strong motivators when linked to the safety and health goals of the company and can result in a real commitment to safety and health.

Employee involvement provides the means through which workers develop and express their own commitment to safety and health, for both themselves and their fellow workers. It also will be of direct benefit to the employer:

- Fewer employee injuries.
- Decreased worker compensation payments.
- Decreased litigation costs relating to worker injury.
- Fewer OSHA noncompliance findings.
- Improved employee morale.
- Improved communication between management and employees.
- Increased employee and management involvement in health and safety related matters.
- Increased productivity and profits.
- Positive public relations.

All of these factors can result in some very positive outcomes.

A caution flag should be raised regarding the issue of employee involvement. With the growth and recognition of the value of employee involvement, there is an increasing number and variety of employee participation arrangements that may have to be addressed from a legal basis. It makes good sense to consult your labor-relations advisor to ensure that your employee involvement program conforms to current legal requirements.

WHY SHOULD EMPLOYEES BE INVOLVED?

Because it's the right and smart thing to do. Here's why:

- Your workers are the persons most in contact with potential safety and health hazards. They have a vested interest in effective protection programs.
- Group decisions have the advantage of the group's wider range of experience.
- Employees are more likely to support and use programs in which they have input.

Employees who are encouraged to offer their ideas and whose contributions are taken seriously are more satisfied and productive on the job.

WHAT CAN EMPLOYEES DO TO BE INVOLVED?

Examples of employee participation include:

- Participating on joint labor-management committees and other advisory or specific purpose committees.
- Conducting site inspections.
- Analyzing routine hazards in each step of a job or process, and preparing safe work practices or controls to eliminate or reduce exposure.

- Developing and revising the site safety and health rules.
- Solve safety and health problems.
- Training both current and newly hired employees.
- Providing programs and presentations at safety and health meetings.
- Conducting accident/incident investigations.
- Reporting hazards.
- Fixing hazards within their control.
- Supporting their fellow workers by providing feedback on risks and assisting them in eliminating hazards.
- Participating in accident/incident investigations.
- Performing a pre-use or change analysis for new equipment or processes in order to identify hazards up front before use.

Employees want to feel like that they have some control over their work lives and safety and health. Participation is one way to accomplish this. Everyone wants to belong and feel wanted; employee involvement in safety and health can help accomplish this.

MANAGEMENT

You, as management, have to make the commitment to involve the workforce in safety and health at the worksite. Since management is in control, it is their prerogative to decide the extent of involvement depending on what they can endure or the amount of control they can forgo. But there are very real positive outcomes that come from employee involvement. It is a very real way to gain commitment to safety and health. Safety and health become personal issues for your workforce.

When you open the door to involvement, the benefits are good, but the “Pandora’s Box” that you have opened may cause you to rethink your decision. You will find that many of the problems brought forth are not strictly what you might feel are safety and health issues, but to those in your workforce they are what they perceive as legitimate subjects to be given consideration. Some of the areas that may come up are:

- Workload (time pressures, work pressures, physical aspects of work).
- Job control (worker influence over his/her job).
- Social support (support of co-workers, supervisors, etc.).
- Job satisfaction (with the work and work environment).
- Monotonous work (bored with work).
- Job clarity (uncertainty of job expectations and ambiguity of worker’s role).
- Psychological stress.
- Organizational climate (e.g., high performance expectations).
- Organizational culture.

Worker involvement will require a commitment by management as well as the feeling that such a commitment is for real and not some sort of setup. It may require that you provide training to workers who are expected to take on roles within the safety and health effort that they are not accustomed to. When everyone is committed, worker involvement can be a positive factor in managing your safety and health effort.

In an office-building environment it is a good idea to have as many eyes as possible helping to insure that safety and health policies and procedures are being adhered to. This is much easier to accomplish when you have the involvement and commitment of the workforce. You might achieve this by having all workers integrally involved, or you might find it better to work through an organized approach such as a joint committee(s). You will need to decide what matches your management approach the best, but some sort of involvement is crucial to safety and health performance in your office environment.

JOINT LABOR/MANAGEMENT SAFETY AND HEALTH COMMITTEES

A joint labor/management committee is a formal committee, which is organized to address specific issues such as safety and health or production processes. It is a committee with equal representation, which gives both parties an opportunity to talk directly to each other and educate each other concerning the problems faced by either group. In contrast, labor or management only committees have self-serving goals with no consensus on solving problems. They are the only ones who have the authority or power to make changes. Thus, joint committees are aimed at gaining solutions, having equal participation, and having some degree of authority or power.

Joint labor/management (L/M) committees have a different purpose than committees set up by either labor or management alone. When compared to other committees existing at the worksite, L/M committees are different both in their goals and methods of operation. In addition, because of the nature of their goals, they are also much more challenging since they require many different skills from all the participants.

Joint committees provide both parties with the opportunity and structure to discuss a wide range of issues challenging them. Neither partner of the labor/management committee has enough information, commitment, or power to institute the changes that the joint committee eventually identifies as critical to the success of the business.

Thus, a key purpose of joint committees is to gather, review, analyze, and solve problems that are critical to the success of the business and are not appropriate for the collective bargaining process. Another purpose for these committees is the formation of a level playing field that has as its ultimate purpose the success of the business. These committees can help build bridges of cooperation that can lead to increased productivity, quality, efficiency, safety and health, and economic gains shared by all parties.

But the purpose of joint L/M committees goes beyond quality and productivity. They are builders of true and honest relationships which help to realize success through focusing on outcomes, using resources more efficiently, fostering real world flexibility, supporting an information sharing system, opening communications, and fostering a better working relationship.

In the past, labor/management relationships were built on confrontation, distrust, acrimony, and the perception of loss or gain of control and power. The ultimate goal, to use an overused phrase, is to attain a “win-win situation.”

With all the downsizing, right sizing, and re-engineering going on within the workplace, individuals believe that they can help and have an impact on their continued employment and the survival of the company, if only asked and given the chance. In order to do this successfully, it is imperative that they have access to the information needed to solve issues facing them and their employer.



Figure 4-1. Joint labor/management committees bring people together to solve problems and enhance communications.

Committee Make-Up

The joint L/M committee should be composed of at least as many employee members as employer members. Labor must have the sole right to appoint or select its own representatives, just as employers have the right to appoint theirs. Both parties should clearly understand that the members of this committee must not only be risk-takers, but fully capable of making the critical decisions needed to make this process succeed.

In order to cover all facets of the workplace, the labor organization may find it useful to have a broad spectrum of their membership represented. Labor should also allow for turnover in its membership and address this issue by identifying and involving adjunct and alternate members. By doing this you will not compromise the committee's progress by having to introduce new members into the committee who are unfamiliar with the process and are untrained concerning the subject matter.

The chairperson must be elected by the committee and this position should be a rotating position between labor and management. Each committee member should receive training on the joint committee process and also receive other specific instructions that are deemed necessary, such as job-related safety and health training. The labor members should be paid for all committee duties, including attendance at meetings, inspections, training sessions, etc.

Record-Keeping

Each participating party (labor and management) should keep its own notes of all meetings and inspections, as well as copies of agendas. This will insure that agree-

ments and disagreements, time schedules, actions to be taken, etc., are not lost, forgotten, neglected, or misinterpreted. Time has a way of encouraging each one of these things to happen. Good record keeping will also assist in keeping the direction and undertakings of the joint committee in focus. The agenda could include the following:

- Date and time for the meeting to begin and a projected time for adjournment.
- To's and From's — who the agenda is from and to whom it is sent.
- Location.
- Review of any audits, assessment, unsolved problems, or inspections.
- Old business.
- New business.

A formal set of minutes and reports on inspections should be maintained by the joint committee. The minutes should include:

- Employer's name and union for identifiers.
- Date and time of meeting.
- Chairperson(s).
- Members in attendance.
- Old business.
- Actions taken and dates completed since last meeting.
- New business.
- New actions and proposed dates of completion.
- Other business:
 - Outside or OSHA inspections.
 - Injury and illness incidents.
 - Educational initiatives.
 - Administrative activities.
- Joint representatives' signatures giving approval of minutes.

Do's and Don'ts of L/M Committees

DO's:

- Always give an agenda to committee members in advance of a meeting; this allows everyone time for preparation.
- Cancel a meeting only for emergencies; hold meetings on schedule.
- Set timelines for solving problems.
- Keep focused on the issues involved.
- Do stay on schedule and stick to the starting and ending times in the agenda.
- Decide on a structured approach to recording and drafting minutes, as well as mechanisms for disseminating them.

- Keep the broader workforce informed of the activities of the committee.
- Keep issues on the agenda until they are resolved to everyone's satisfaction.
- Give worker representatives time to meet as a group and prepare for the meeting.
- Be on time for the meetings.
- Make sure that everyone understands the issues and problems to be discussed.

DON'Ts:

- Tackle the most difficult problems first since some early successes will build a stronger foundation.
- Work on broadly defined issues, but deal with specific problems and concrete corrective actions.
- Allow the meeting to be a gripe session when problem solving is the end result.
- Allow any issue to be viewed as trivial; each issue is important to someone.
- Let individual personalities interfere with the meetings nor the intent of the committee.
- Be a "know-it-all" and assume you know the answer; give everyone an opportunity to participate in solving the problem.
- Neglect to get all the facts before trying to solve an issue or problem.
- Prolong meetings.
- Delay conveying and communicating the solutions to problems and the outcomes or accomplishments that the committee has achieved.
- Expect miraculous successes or results immediately since many of the problems and issues did not occur overnight.

Organizing a Joint Committee

When organizing a joint committee, some specifics should be set forth:

- Set up the ground rules or procedural process.
- Have a set place to meet.
- Establish, as a group, the goals, objectives, function, and mission of the committee.
- Select the frequency of the meetings (at a minimum, monthly), as well as set parameters for the length of meetings.
- Agree to maintain and post minutes of all meetings.

Expectations

Anytime something new is undertaken, such as joint labor/management com-

mittees, there are expectations that accompany these new endeavors. Some of the expectations are:

- Improved workplaces and work environment.
- Improved working relationships.
- Positive, cooperative approaches.
- A compromise for mutual interests, versus self-serving interests.
- A true team approach.
- Sharing of information, thinking and substantive decision making.
- New/fresh ideas.
- Increased participation and involvement.

Outcomes

A study done by the Work in America Institute lists some of the outcomes you can expect when you have a functional joint labor/management committee. According to this study, both labor and management stand to benefit from joint undertakings. Some of the benefits include:

- Economic gains: higher profits, less cost overruns, increased productivity, better quality, greater customer satisfaction, and fewer injuries and illnesses. Working together, workers and supervisors can solve problems, improve product quality, and streamline work processes.
- Improved worker capacities which more effectively contribute to the improvement of the workplace.
- Human resource benefits.
- Innovations at the bargaining table.
- Committee member growth.
- Workplace democracy.
- Employment security.
- Positive perceptions.

Other outcomes that will, in all likelihood, arise from joint L/M committees are:

- Shared responsibilities.
- Increased individual involvement.
- Company and labor proactive with each other.
- Better communication between company and labor.
- Employee ownership of ideas, goals, activities, outcomes, and the company.
- Union leadership and members more challenged.

JOINT LABOR/MANAGEMENT OCCUPATIONAL SAFETY AND HEALTH COMMITTEES

A joint labor/management occupational safety and health committee is a specialized application of the joint labor/management committee and is an excellent format that others can replicate. This type of committee is organized to address specific workplace issues; such committees

- Monitor the safety and health programs.
- Inspect the workplace to identify hazards.
- Conduct and review accident investigations.
- Recommend interventions and prevention initiatives.
- Review injury and illness data for incident trends.
- Act as a sounding board for workers who are expressing health and safety concerns.
- Become involved in designing and planning for a safe and healthy workplace.
- Make recommendations to the company regarding actions, solutions, and program needs for safety and health.
- Participate and observe workplace exposure monitoring and medical surveillance programs.
- Assure that training and education fully address safety and health issues facing the workplace.

The goals of the joint labor/management occupational safety and health committees are:

- To reduce accidents, through a cooperative effort, by eliminating as many workplace hazards as possible.
- To reduce the number of safety- and health-related complaints filed with regulatory agencies without infringing on the workers' federal and state rights.
- To promote worker participation in all safety and health programs.
- To promote training in the areas of recognition, avoidance, and the prevention of occupational hazards.
- To establish another line of communication whereby the workers can voice their concerns regarding potential hazards and then receive feedback on the status or action being taken.

SUMMARY

What can joint labor/management committees accomplish?

- Increased commitment to achieving the organization's goals or mission.

- Improved productivity, safety and health, customer service, and product quality.
- Joint resolution of problems and issues facing the organization.
- Shared responsibility and accountability for results and outcomes.
- Better and more constructive relationship between labor and management.
- Enhanced employee morale and job satisfaction.
- Heightened communication and information sharing that brings all employees into the decision-making process. This helps them understand the mission, goals, and objectives of the organization and fosters employee support of the organization's undertakings.
- Increased job security and compensation.

In order to make joint labor/management committees work, certain actions must occur and certain procedures must be followed:

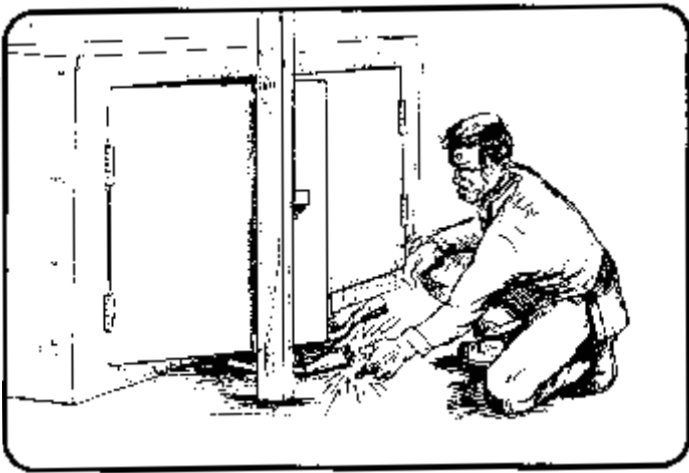
- Ensure that upper management supports the joint effort and that this is conveyed both to the union and other company representatives.
- Acknowledge that reservations exist on both sides and try to gradually build trust.
- Keep the committee focused on its goals and mission.
- Strive for a good balance of employee and management representatives who are willing to invest in the process.
- Keep the committee structured; don't allow it to turn into a bull session.
- Remember that the committee is designed to serve all workplace constituencies, not just workers and management.
- Assure that committee leadership is elected or selected, by consensus, to fill various roles.
- Make decisions fairly and use the consensus process.
- Know and work within the guidelines of federal and state regulations.
- Don't raise issues that really must be addressed at the collective bargaining table; it will only undermine the viability and success of this process.

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CHAPTER 5

WORKERS' COMPENSATION



Worker received injuries from contact with electricity. (Courtesy of Mine Safety and Health Administration.)

Workers' compensation is a unique system of laws and insurance designed to provide medical treatment and a portion of income to workers as a result of job-related injuries or illnesses. Workers' compensation insurance is federally mandated and each of the fifty states has established specifications for insurance administration and prompt payments of benefits through legislation and case law.

We often think of the workers' compensation system as benefiting only the employee and not the employer. The latter may not be so obvious, even to managers who are extremely familiar with workers' compensation. As far as they are concerned, workers' compensation laws require them (or their insurance carriers) to pay for the benefits that are due the injured workers. Workers' compensation comes directly off your company's bottom line—straight out of profits. Payment for medical expenses, other expenses reimbursable to the employee, and lost wages are all called loss.

Workers' compensation was a development to provide for these workers and their families while offering protection from lawsuits to the companies who had to hand out the payments. In effect, workers' compensation is a no-fault insurance system. The worker gets compensated in return for waiving his or her rights to sue the company.

Prior to the institution of workers' compensation legislation, the financial liability of American employers for worker injury was judged by principles established by English common law. These principles virtually assured that employers would not be held liable for work-related harm to employees. Under the common law, employees did not automatically receive payments when injured on the job and were required to sue the employer in order to obtain compensation for their injuries. If the employee did sue his employer for damages, the employer had four legal defenses that could be asserted and if any one of these defenses was accepted by the court, the employer did not have to pay. These defenses were:

1. The employee contributed to the cause of the accident.
2. Another employee contributed to the accident cause.
3. The employee knew of the hazards involved in the accident before the injury and still agreed to work in the conditions for pay.
4. There was no employer negligence.

EMPLOYER LIABILITY

This action first took the form of employer liability laws, which were passed during the period from 1900 to 1910. In 1911, however, several states passed the first lasting workers' compensation laws. The foundation of the workers' compensation law is the application of "exclusive" or "sole" remedy: that employees relinquish their rights under common law in exchange for sure recovery under the workers' compensation statutes, regardless of whether an injury is their fault—the concept of "no fault." Employers, in accepting a definite and exclusive liability, assume an added cost of operation (in the form of insurance premiums and claims), which in time can be actuarially measured and predicted.

State requirements and regulations vary widely. Some states require coverage for private employment, whereas others may exempt those with a stipulated number of employees. Many states also exclude certain types of employment because of the nature of the work. Minors are covered by workers' compensation in all states.

Although there is considerable variation in the laws among the states, The U.S. Chamber of Commerce notes six basic objectives for workers' compensation laws. These objectives are:

1. to provide sure, prompt and reasonable income and medical benefits to work-accident victims, or income benefits to their dependents, regardless of fault;
2. to provide a single remedy and reduce court delays, costs and workloads arising out of personal injury litigation;
3. to relieve public and private charities of financial drains incident to uncompensated industrial accidents;

4. to eliminate payment of fees to lawyers and witnesses as well as time-consuming trials and appeals;
5. to encourage maximum employer interest in safety and rehabilitation through appropriate experience-rating mechanisms;
6. to promote frank study of causes of accidents (rather than concealment of fault)—reducing preventable accidents and human suffering. (1966 Analysis of Workers' Compensation Laws, U.S. Chamber of Commerce, p. vi)

To some extent, most state and federal laws address the objectives set forth above. Nevertheless, the number of workers' compensation laws is great and variation in the laws often significant. Therefore, the bulk of this chapter will be dedicated to a general discussion of workers' compensation laws noting common aspects and identifying differences when appropriate. The control of costs related to workers' compensation will be discussed in the last part of the chapter.

AN EXCLUSIVE REMEDY

Although there exist more than 50 workers' compensation laws within the United States, these laws can be classified as either compulsory or elective. Under an elective law an employer may either accept or reject coverage. However, if an employee sues for damages because of an injury or illness arising out of employment, rejecting employers lose the common law defenses discussed above. Texas, New Jersey, and South Carolina are the only states which have a form of elective coverage. In New Jersey employers or employees may elect to defer coverage by the state's worker's compensation law. Texas allows only employees to choose to forgo protection by worker's compensation and in South Carolina employers of less than four persons, including partners and sole proprietors, may choose not to provide coverage. Compulsory laws require all employers of covered employees be provided benefits according to these provisions of the applicable act, which are for the most part no-fault in nature and therefore disallow employee suits against employers for damages due to injury or illness as a result of work activities. In those jurisdictions where an employee can reject coverage by the act and sue an employer, the employer is normally allowed to assert some of the common law defenses in court.

Even though most states provide for workers compensation as the exclusive remedy for covered employees impacted by injury or illness arising out of work, a few jurisdictions now allow workers to sue employers in tort and also receive workers' compensation benefits. An example of such a state is West Virginia where the courts have held that some employer conduct resulting in injury or illness to employees was so egregious that the employer no longer deserved protection by the exclusive remedy provision of the workers' compensation law. In some jurisdictions, employers may be included as a third party in a lawsuit brought by an employee against another firm, such as an equipment manufacturer, and found financially liable for a portion of the award. In these cases, the firm sued by the employee will sue the employer for any negligence of the employer that they can demonstrate contributed to the injury or illness. Employer equipment maintenance is often a point of issue in these suits. It is impossible to document the exclusive remedy status of all jurisdictions in this chapter. It is important to remember that the best way of avoiding these

legal quagmires is to provide a safe and healthy work environment and thus avoid employee injury or illness.

COVERED EVENTS

Originally workers' compensation legislation provided benefits for harm to employees due to injuries only, ignoring the adverse consequences of occupational exposures that result in illness. Now all jurisdictions recognize that illnesses as well as injuries arise out of employment and have provided for benefits in their compensation statutes for both. Although most states do not provide coverage for ordinary illnesses of living, which are unconnected to employment, both injuries and illness arising out of and in the course of employment are normally covered.

Workers' compensation statutes normally limit benefits to injuries or occupational illness that arise out of and occur in the course of employment. This test, which is almost universally accepted, is designed to assure a relationship between the work activity and the injury or illness. Although the goals of this bifurcated test are relatively straightforward, the facts surrounding individual claims are often fraught with uncertainty. This uncertainty is most pronounced with occupational illness claims. Although there are sometimes controversies as to whether an employee is entitled to benefits following an injury, it is normally not as difficult to determine if an injured employee fulfills the requirements for benefits as it is an employee claiming an occupational illness. There is often a long latency period between an employee's exposure to a disease agent and the onset of illness. During this period employees frequently change jobs or even employers, moving away from the disease agent and making it difficult to substantiate exposure.

The test aspect, in the course of employment, most often refers to the time frame and location of the event producing the injury or illness. Most employees are deemed to be in the course of employment upon entering their employers' property at the start of the workday until they leave at their shift's end. Employees are normally not compensated for events occurring while traveling to and from work unless an unusual employee relationship can be demonstrated for the travel, such as being recalled to the work site after leaving.

The arising out of employment component of the test for workers' compensation benefits examines the causal relationship between the employment and the injury or illness. In general, employees are considered to be fulfilling this test if they are involved in activities related to their employment. Employees performing work not related to their employment, such as running personal errands, doing work for themselves on company equipment, or who are intoxicated, participating in horseplay or serious and willful misconduct may not receive benefits.

SELECTING A PHYSICIAN

The permanence and severity of an injury or illness is initially determined by the treating physician. In jurisdictions that provide injured employees the opportunity to select the initial treating physician, employers can require employees to also be evaluated by a physician of the employer's choosing. In some jurisdictions, employers may require employees to first be evaluated by a physician selected by the

employer or require the employee to choose from a group of physicians established by the employer.

If the employer is allowed to choose the first treating physician, employees are often allowed to consult a physician of their choosing at no cost. Jurisdictions that allow employers to establish a stable of physicians from which employees are encouraged to select usually allow employees who do not desire to be treated by a physician from the employer's list to select a practitioner not on the list. However, employers are only required to pay for medical services provided by non-listed physicians at the same fee schedule as that for the accepted list.

If the employee's and employer's physicians disagree as to the medical consequences of an injury or illness, in many jurisdictions a third physician, agreeable to both the employee and employer, will be selected as an impartial medical evaluator. In selecting a physician, the most important consideration should be that person's ability to treat the injury or illness and help the employee get well. However, and unfortunately, some physicians have acquired a reputation for being biased as an employees' physician witness or an employers' witness with respect to workers' compensation issues and care must therefore be exercised in this selection process.

After an employee accepts treatment beyond that provided in response to an emergency, there are normally restrictions impeding the employee's ability to change doctors unless by referral from the treating physician, by agreement with the employer and the insurance company paying the medical bills, or with the approval of the workers' compensation regulatory body of the jurisdiction in which the employee was injured. It is therefore very important to select medical doctors with appropriate skills and for employers to assist employees in selecting appropriate medical practitioners.

BENEFITS

Workers' compensation benefits are provided: (1) as replacement income for wages lost by employees because of their inability to work due to an occupational injury or illness and as financial remuneration for permanent loss of all or part of a bodily function, (2) for medical costs associated with an injury or illness from a job related exposure and (3) for rehabilitation following a job-related debility. Most jurisdictions attempt to structure benefits so as to prevent workers from suffering economic hardship because of occupational injury or illness.

Medical Benefits

Medical benefits pay all of the costs associated with medical treatment as a result of an injury and are usually provided without a dollar or time limit. Most work-related injuries involve only medical benefits (that is, medical only claims) because substantial physical impairment or wage loss does not occur. These medical benefits represent approximately 30 percent of the total dollars paid out in the compensation system. Medical benefits are unlimited in all states.

Cash Benefits

The purpose of cash benefits under compensation is to replace the loss of income or earning capacity of the injured workers due to the occupational injury or

disease. The amount of the benefit and the length of time over which it will be paid are based on the type of disability involved. There are four types of disability:

1. Temporary total disability (TTD)
2. Permanent total disability (PTD)
3. Temporary partial disability (TPD)
4. Permanent partial disability (PPD)

By far, the largest number of cases involves temporary total disability. The types of disability have standard definitions.

Temporary total disability (TTD) renders the employee incapable of any work for a limited time. Such disability, prior to maximum medical improvement, is of a nature that prevents return to work. However, full recovery is eventually anticipated.

Permanent total disability (PTD) precludes the employee from returning to work ever. Some ambiguity exists between impairment and disability, which are not the same. Impairment is an anatomic or functional abnormality. For example, a facial disfigurement is an impairment. Also, a restricted range of motion for the hand is an impairment. A disability, on the other hand, is a limitation in performance, which may be caused by an impairment. One is disabled, for example, if unable to dress oneself. The inability to assemble nuts and bolts is also a disability.

Temporary partial disability (TPD) anticipates the employee's full recovery. Such disability, prior to maximum medical improvement, results in reduced earnings but not in total incapacity. A partially disabled patient who shows rapid signs of clinical improvement falls under this category and has a very good chance of return to work very soon.

Permanent partial disability (PPD) implies the injured employee will not fully recover. However, the employee has some potential to do work. The disability is some form of permanent anatomical impairment that has an effect on subsequent employment. PP disabilities include loss of a finger or disfigurement.

Until recent years, the management of prolonged disability was as simple as not allowing the worker to return to the job until totally recovered—that is, one hundred percent fit. Under scrutiny, this is an extremely costly process compared to providing a modified workplace to accommodate the injured employee or giving him or her part-time work.

Income benefits for temporary and permanent total disability are expressed as a percentage of the employee's normal wage. Most states use a formula to determine the amount of benefits the person is entitled to, as well as to calculate the maximum and minimum benefits. Some states also limit the total number of weeks and the total dollar amounts of benefit eligibility. The current maximum weekly benefit in most states is 66.6 percent of the injured worker's normal wage. Where there is permanent total disability, most states provide payments for life.

Replacement income and payment for loss of function are often referred to as cash benefits. Cash benefits are normally further categorized according to the severity and permanence of the disability associated with the injury or illness as follows: temporary total disability, permanent total disability, temporary partial disability, permanent partial disability and death. Cash benefits normally comprise a greater percentage of workers' compensation benefits costs than costs associated with medical care and rehabilitation.

Temporary total disability is an often misunderstood term which does not imply that a worker is confined to bed. It means that the treating physician has determined that the employee is unable to perform any work. This is of course a legal definition and the reality may be somewhat different.

A more thorough analysis often leads to the realization that in many instances employees are considered totally disabled to perform work only because of their employer's policy. For example, if an employer's policy requires that an injured employee be competent to perform all function of a job before returning to work following an injury, an employee who can perform most of the job tasks will still be considered totally disabled by most treating physicians until capable of performing all functions related to the work. Such employees may be able to perform many other functions of normal life unimpeded. This seeming contradiction often results in misunderstandings and accusations of "featherbedding." Permanent total disability implies that an employee's infirmities are such that the worker cannot for the foreseeable future perform any regular work in the existing job market.

Temporary partial disabilities limit employees' capacity to do their regular job. These workers are often able to perform many tasks related to their job but are in some ways limited in the performance of the total job or are unable to do the job for the normal length of time. These employees are also often able to perform other jobs that do not require the abilities for which the employee is temporarily deficient. Partially disabled employees can often participate in "return to work" programs that allow employees to perform tasks within their limitations while restricting other activities. Well-run, ethical, return to work programs enhance employee recovery and limit workers' compensation costs. Such programs also allow many workers, who would otherwise be classified as temporarily totally disabled, to return to useful work.

Permanent partial disability relates to the permanent loss of a body part or functional limitations to the body as a result of an injury or illness. The extent of this type of disability is determinable only after the treating physician concludes that additional physical improvement will not occur.

Death is the final category for which income replacement benefits are paid. Although the death of an employee is the most catastrophic event provided for in workers' compensation legislation, it is often not the most expensive.

SURVIVOR BENEFITS

Survivor benefits are designed to provide replacement income for the families of workers whose deaths are related to work and to pay a portion of the burial expenses. All jurisdictions provide for such benefits but, as with all other workers' compensation benefits, with considerable variation.

As a general rule, the same calculations and factors used to determine the amount of benefit payments a worker would have received for total disability are used in determining weekly benefits to be paid to a surviving spouse with children. This includes a percentage, usually 66 percent but it varies by jurisdiction, of the worker's average weekly wage with maximum and minimum thresholds similar to those discussed for total disability. Most states have established time limits for benefit payments that provide for continuation of payments for dependent children until they reach a designated age, normally 18. Benefit payments for children may be extended beyond the established age if the dependent has not finished school, and for the spouse until he or she remarries.

REHABILITATION

Not all injured workers respond to treatment and return to gainful employment. Acknowledging the difficulty of overcoming some injuries without significant assistance, most jurisdictions now require employers to provide rehabilitative services for employees. The goal of such services is to return the injured employee to productive work and gainful employment. In general these services are classified as either medical or vocational. Jurisdictions differ significantly in the way rehabilitative services are provided and funded. It is therefore necessary for interested persons to understand the requirements of the jurisdiction in which they operate.

Medical Rehabilitation

Medical rehabilitation is usually dictated by the accepted course of treatment for a specific injury and can often not be distinguished from medical treatment. Rehabilitation is viewed as an integral part of standard medical treatment and often begins immediately after the patient is stable. Services such as physical and occupational therapy are rehabilitative in nature and are often prescribed to assist employees regain function, mobility, and strength in injured extremities. Medical rehabilitation frequently requires many months to complete with the rehabilitative services accessed once or more weekly.

Most workers' compensation laws obligate employers and insurers to pay for all medical care including rehabilitation. This can be accomplished by providing the services in-house, contracting with outside providers, or through local medical facilities as part of the medical treatment process.

Vocational Rehabilitation

Vocational rehabilitation is the next step in the process of returning injured workers to gainful employment. Injured persons, who do not adequately recover during medical treatment and medical rehabilitation to continue their former profession in the same manner as before injury, are prepared for either a new career or taught to perform their former job in a new manner during vocational rehabilitation.

Tested methods of eliminating obstacles to employability through vocational rehabilitation include:

1. Job modification. After performing a job analysis the workplace is modified to allow an employee to return to work with the residual disabilities.
2. Adaptive devices. These include grasping aids, orthopedic supports, or special tools.
3. Work hardening. An individualized work-oriented treatment program to improve the employees physical capacity by involving the person in supervised simulated or actual work.
4. Retraining. This should be done only after careful consideration of other options as it requires the most adjustment and therefore risk.

Injured workers are provided several options for vocational rehabilitation. All states now have agencies dedicated to providing vocational rehabilitation ser-

vices for injured workers Vocational rehabilitation is an important step in the return to employment process for many injured persons. Although some employers hesitate to participate in this process because of an ill-founded concern over the initial cost of vocational rehabilitation, the benefits of rehabilitation are great. The employee benefits both psychologically and physically by becoming a productive citizen engaged in meaningful work and the employer benefits by reducing the worker's compensation costs of the firm.

ADMINISTRATION

All jurisdictions have an agency or department responsible for overseeing and administering the worker's compensation law for that jurisdiction. The primary goal of the administrative organizations is to ensure that the laws are complied with and that workers receive appropriate compensation under the statutes. The responsibilities and functions of the agencies are set forth in the statutes of each jurisdiction and vary significantly.

In some jurisdictions the law requires the administrative organization to closely monitor each case to insure that all is performed in accordance with the statute. Others only serve to adjudicate contested claims and issues of law. In many states employees are left to their own devices in obtaining benefits as the state assumes that employees are knowledgeable respecting worker's compensation benefits.

To reduce the number of small claims, most states impose a waiting period during which income benefits are not payable. This waiting period does not affect medical payments, which begin immediately after an accident. If disability continues for a certain number of days or weeks, most laws provide for income benefits retroactive to the date of the injury. If a worker suffers merely a minor injury, causing him or her to miss only a few days of work, the worker is eligible only for medical payments. Workers' compensation pays for the medical costs, and the employee's lost work time is covered by the normal sick leave benefit provided by the company.

Inform the workers' compensation administrator promptly. Experience has proven that reporting delays substantially increases costs.

Worker's compensation claims may be either contested or uncontested. If uncontested, the employer, or the insurance company of the employer, pays the injured employee according to the system set forth in the law. The direct payment system and the agreement system are the most usual methods employed for this purpose. In the direct payment system the employer automatically begins paying compensation without an agreement in place. The laws set forth the amount of the benefit. In the agreement system the parties agree on the amount of benefit before payment is made. The agreement system is the most commonly used.

The administrative agency is usually responsible for providing a system by which contested claims can be judged. This system usually begins with a hearing before a referee or hearing officer. The findings of this hearing can usually be appealed to a larger commission or board of appeals by either the employee or the employer. The next appeal is normally to the courts who are interested in issues of law rather than fact.

Workers' compensation laws are administered through the state court system, by a special "industrial" or "compensation" commission or board established for this purpose, or by a combination of both. This is to ensure the prompt payment

and effective disposition of cases. An effective workers' compensation administration system should include the following:

- Supervision or monitoring of statutory compliance by employers, employees, insurance carriers, and the legal and medical professionals involved in the program.
- Investigation and adjudication of disputed claims.
- Supervision of medical and vocational rehabilitation funds.
- Management and disbursement of second-injury funds.
- Collection and analysis of occupational and claims data, and evaluation of the program's effectiveness and efficiency.

SECOND INJURY FUNDS

Second injury (or subsequent injury) funds are another feature of most state systems. These were developed to meet the problems created when a preexisting injury is complicated or worsened by a second injury, producing a disability greater than that caused by the second injury alone. Under the second-injury fund program, the employer need only pay compensation related to the disability caused by the second injury alone.

RISK AND INSURANCE

The risks associated with worker's compensation exposures are normally managed by either purchasing insurance or self-insurance. In most jurisdictions, companies that wish to self-insure their worker's compensation risk must demonstrate that they have sufficient financial resources to fund losses. Many self-insuring companies also purchase insurance for catastrophic risks. This insurance is designed to protect the company's financial stability should a large, unexpected loss occur. Self-insuring companies fund normal worker's compensation costs through internal capital and only contract for insurance coverage for unexpected, significant losses. Companies that elect to self-insure worker's compensation risks frequently employ the services of a third party to administer the compensation program. This service normally includes following up on claims with physicians and writing checks to employees and providers.

Most companies provide worker's compensation coverage through traditional insurance methods in which the insurance company pays the costs associated with worker's compensation claims for the period insured. Insurance companies also provide many services such as third party administration, loss control, and injury analysis depending on the contract and state law.

Elective workers' compensation laws allow the employer to select whether or not to carry workers' compensation insurance. Compulsory workers' compensation do not give employers the option; they must carry workers' compensation insurance.

Insurance companies are compensated for the services that they provide through premium payments made by the insured company to the insurer. The amount

of the annual premium is principally based on the type of work the insured performs, the classification code, and the insured firm's history of injuries and illness over a given past period, the experience modification rating.

Classification codes were developed by the National Council on Compensation Insurance (NCCI) to rationalize insurance premiums so that firms engaged in work that is relatively more dangerous will pay more in premiums than those performing less dangerous tasks.

Whereas classification codes are based on the risks associated with a type of work, without regard to how safely an individual firm performs, experience modification codes (EMR) are concerned with the safety performance of the firm to be insured. Each firm begins with an EMR of 1.0 (100 percent), which means it must pay the average premium for the appropriate classification code. Adjustments of this percentage are made by the NCCI based on the firm's injury and illness losses over a specified period, normally three years, and in compliance with jurisdictional requirements. If a firm's safety performance is better than expected, the EMR can be reduced so that the firm pays less than 100 percent of the average premium. The percentage reduction is predicated on the firm's success in avoiding losses. Companies that have worse than expected loss records will have to pay more than the average premium. By far the largest costs associated with workers' compensation are losses. The loss history of a company drives its premium costs. The workers' compensation premium rate is the amount charged per \$100 of payroll.

Workers' compensation insurance rates are based on accident frequency, loss rate in terms of dollars, and severity. The mathematical combination of these factors is called an experience modifier, an expression that is weighted to frequency:

$$EM = f \times LR \times S$$

Where:

EM = experience modifier
f = frequency
LR = loss rate in dollars
S = severity

However, the continued inflationary trend in medical costs is an area that needs to be addressed because most benefits that are paid go toward medical expenses. In addition, most insurance executives agree that the following factors have caused workers' compensation costs to increase:

- High average weekly wage.
- Liberal interpretations of workers' compensation benefits.
- Attorneys and unions assisting employees.
- The number of recognized occupational diseases.
- Many states experiencing longer duration of claims for disabled workers.

Many employers have not made the necessary commitment to workplace safety and loss control programs because they viewed workers' compensation insurance as a "cost of doing business."

It is generally recognized that employers can control their accident costs through an effective loss control program, emphasizing accident prevention and effi-

cient claims administration. Accidents, whether they result in personal injury, property damage, or both, are a major drain on corporate resources. In fact, “direct,” or insurable, workers’ compensation costs are minuscule compared with “indirect,” or uninsured, costs. These uninsured costs include the time wasted by supervisors and other employees, the cost of damaged products or equipment, downtime in processing operations, the cost of first aid, the cost of training a replacement worker, and so on. Uninsured costs represent a far greater cost to the employer and have an enormous impact on the cost of production.

The best hedge against increased workers’ compensation cost increase is prevention. Prevention of occupationally-related injuries and illnesses can take many forms and you will need to decide what techniques will work best for your particular office building. Most workers’ compensation insurance carriers offer excellent safety engineering or loss control services to their policyholders, which can greatly aid an employer in improving workplace safety.

LOSS CONTROL

The best way of controlling costs associated with workers compensation is by reducing injuries and illnesses at the worksite. The rationale for this for self-insured firms is obvious since the firm is the direct payer of all costs associated with the injury or illness. Insured firms also benefit by reducing injuries since future EMRs are based on past safety performance.

Most state laws set forth the method to be used in determining future EMRs and in many of these formulas the number of injuries, the incidence of injury, is more important than the cost or extent of the injuries. For example one injury costing \$45,000 is less harmful to a firm’s EMR than four injuries costing \$10,000. The rationale for this policy is that once an incident occurs the extent of injury is often a matter of chance and therefore the \$10,000 events could have easily been much more costly.

Another cost saving technique for insured firms is to pay as many claims as the state law allows from the resources of the firm and not through the insurance company. Some states require all injuries for which a claim could be made to be reported while others allow companies to pay modest claims without involving the insurance company or state. Since EMRs are determined based more on incidence than severity, avoiding the reporting of minor injuries will improve the firm’s future EMR.

Return-to-Work Programs

Return-to-work programs provide an important tool in controlling worker’s compensation costs for both the self-insured and insured employer. Workers returned to work do not receive disability payments and, absent medical expenses sufficient to require state notification, do not count in determining future EMRs. Employers with well-designed return-to-work programs have documented significant savings in worker’s compensation costs and improvements in other costs of production. Improvements in injury and illness incidence rates have also been documented after the institution of a well-managed return-to-work program.

Return-to-work programs may be known by several names, including “modified duty,” “light duty,” or “transitional duty,” but all have the same objective: to

return employees to the workplace, among their co-workers, as soon as they are able to perform some or most of their regular job functions.

A team approach is vital to a successful return-to-work program. The team leader must take the initiative to obtain all relevant information regarding the injury or illness either from a physician or other sources such as:

- Damage done to the body structure, tissues and/or organs.
- Type of disability due to the injury/illness.
- Physical, physiological, and psychological problems associated with the disability.
- Brief description of the therapeutic and rehabilitative measures recommended by the physician.
- Prognosis for such a disability.
- Type of disability.

Failure to consider using a return-to-work program may cause you to have to pay for a claim over an extended period. (See Table 5-1.) You could entirely lose an employee for failure to monitor and get him or her back to work.

Table 5-1	
Probability of Return-to-Work Based On Number of Lost Work Days	
<u>Lost Work Days</u>	<u>Probability to Return-to Work</u>
6 Months	50%
1 Year	25%
2 Years or More	0%

Employees also benefit from return-to-work programs. There is now significant medical documentation that testifies to the therapeutic value of employees returning to appropriate work as soon as possible after injury or illness.

Remember that workers' compensation indemnity benefits are not taxed. Therefore, as the average weekly wage benefit levels approach actual wage levels, the incentive to return to work is bound to diminish. It would be better if the benefits that the injured worker received were limited to a level that would encourage a return to work as soon as it is physically possible to do so.

When an employee is injured, the responsibility for initiating the return to work program is the employer's. The employer must maintain timely and constant contact with the employee, the insurance company, and the employee's physician. The company must assure the physician that work is available that meets the limitations of the employee and that the company has in place a system to assure compliance with the limitations. The employer must also notify the employee of the availability of work within the limitations imposed by the physician and when to return to work.

The activities of workers who return to work must be monitored to ensure that they are working within the limitations set forth by their physician. Supervisors

must understand the importance of the return to work program and be instructed not to allow employees to perform tasks beyond their restrictions even on a voluntary basis. Supervisors must set a positive tone for the rest of the employees.

Job Modification

As an integral part of the return-to-work program, job modification may need to be accomplished. Job modification is carried-out by facility personnel. Modification of the existing job may require inventing a different (but meaningful and productive) job to enable early return to work. In a study conducted by William M. Mercer, Inc. for Safeway.

- Modified workers returned to full duty (at maximum recovery) 38 percent sooner.
- Modified workers saw a doctor 18 percent fewer times.
- Medical payout was 43 percent less.

To be truly effective, however, the loss control program requires employer involvement—integrating the safety and loss control strategies into all aspects of operations. A management-supported safety program should include some of the following:

- Job safety analyses.
- Training programs.
- Supervisory accountability programs.
- Safety committees.

Hiring Practices

As part of the loss control effort, employers need to review their hiring practices. A good hiring practice will insure that you have the right person for the job and that they are physically able to do the job. Using the following hiring practices will help assure that the person that you are hiring has the right profile for the job and assigned tasks.

- Require the applicant to complete the application at the workplace, rather than taking it home.
- Implement substance abuse testing.
- Provide each application with a detailed job description.
- After the interview, tour the workplace, showing the applicant where he or she will work.
- After a conditional offer of employment, consider a physical examination designed to the job description.
- After a conditional offer of employment, if a physical is not given, consider asking the employee whether he or she has had any prior claims or injuries.
- Institute a training period with criteria that the employee must complete satisfactorily during that time period.

Substance Abuse Programs

Substance abuse is a major factor in workplace accidents. "Substances" refer to both legal and illegal drugs (for example, marijuana, cocaine, heroin, and methamphetamines). Although the use of over-the-counter and prescription drugs has increased, the most serious problem is alcohol abuse. This is why the following should be accomplished:

- Establish a substance abuse policy, clearly prohibiting use, possession, or trafficking in alcohol or drugs at work, and specify program parameters.
- Implement an employee assistance program (EAP). This provides confidential access to treatment.
- Implement a drug-testing program. The program can include pre-employment, post-accident, random, or site testing procedures. Reference the guidelines as published in the Drug Free Workplace Act or as specified by the U.S. Department of Transportation.

Employee Assistance Programs (EAPs)

EAPs provide employees with access to treatment for a variety of addictive behaviors and mental health ailments. Whether the problems are personal/family or work-related, employees who are preoccupied will be less productive and more likely to have accidents.

Ergonomics Programs

Ergonomics programs are initiated to identify workplace musculoskeletal hazards, establish interventions, and prevent cumulative trauma disorders (CTDs). CTDs are among the fastest growing occupational health concerns and include lower back strains, sprains, and repetitive motion injuries/illnesses such as tendonitis and carpal tunnel syndrome.

Wellness Programs

Wellness programs supplement an employer's health insurance program and include smoking cessation programs, weight management, shift work counseling and sleep management, cholesterol and blood pressure monitoring, lifestyle analysis, and exercise programs. Some employers offer an annual physical to all employees as part of the program. An injured worker who is in good physical condition often recovers faster, which is a real advantage to employers, family, and the worker as well as the containment of workers' compensation cost (see Figure 5-1).

INJURY MANAGEMENT PROGRAMS

Injury management programs are used to establish a communications process or standard that allows all interested parties to participate in the claims process from the time of injury until the claim is closed. The following should be an integral part of your injury management program:



Figure 5-1. An office building's wellness center as a part of prevention.

- Injury reporting at the workplace
- Three-point contact by the adjuster
- Clinic for treatment
- Substance abuse testing (if applicable)
- Accident investigations and reports
- Corrective action completion
- Return to work
- Ongoing claim status
- Ongoing medical treatment
- Post claim ADA or other accommodation issues
- Discharge from treatment and claim resolution

Medical Case Management

Medical case management is a system for establishing and maintaining communication among injured employees, employers, insurers, and medical providers. Medical case management focuses on active rehabilitation that will expedite the return to work and help an employee achieve maximum medical improvement (MMI).

Case management is a tool for managing claims before some complicating circumstance arises. Proactive case management assigns a case manager to every claim that meets specified criteria including lost time claims, amputations, injuries requiring surgery, injuries requiring lengthy physical therapy, and catastrophic claims. The results of aggressive case management include lower medical costs, lower indemnity costs (less time away from work), and lower legal costs—including fewer lawsuits overall.

Directing Medical Care

Many states now allow an employer to direct some or all of the medical care provided to an employee for a compensable claim. There may be specified time periods for this opportunity, such as thirty to ninety days. Self-insureds can direct all medical care.

Preferred Provider Networks

Preferred provider organization (PPOs) networks are established by an insurance carrier or a third party administrator (TPA) to select hospitals and medical providers who will agree to negotiate fees and participate in managed care programs.

Claims Reviews

Periodic claim reviews are usually held at an employer's office. These reviews provide an excellent opportunity for the employer and the claims adjusters to discuss open claims and claimant progress toward recovery or MMI.

Issues discussed at claim reviews include quality of medical treatment, employee cooperation with medical treatment, the availability and use of modified duty, loss-control activities accomplished to prevent recurrence, and a discussion on litigated claims.

Claim Audits

Claim audits are performed on an annual basis and are used to verify performance standards. Performance standards may be established by an insurance carrier or broker, listing the "best practices" for claims handling and resolution.

Claim audits take place at an insurance carrier's office or a TPA's office(s) to allow access to the claims files, the adjuster notes (usually on computer), and the adjuster.

SUMMARY

Through the institution of a no fault system for benefits, workers' compensation laws eliminated the requirement for employees to sue employers to obtain financial assistance for an injury suffered on the job. Employers were also protected by the no fault system through relief of liability from common-law suits asserting negligence.

The "sole remedy" or "exclusive remedy" concept in workers' compensation insurance protects an employer against worker liability suits in most states. For example, one form of liability in most states can increase an injured worker's benefits to some specified maximum amount if the injuries are caused by "serious and willful misconduct" by his or her employer. These additional benefits, assessed as a penalty, are uninsurable and must be paid by the employer.

Some states also permit an employee to sue a fellow employee if his or her injuries were caused by an intentional assault by that person or if the fellow employee was intoxicated or under the influence of drugs or illegal substances.

It is the employer's responsibility when a worker has an occupationally related injury or illness to:

1. Get medical treatment for the worker.
2. Have the employee complete a notice of injury or illness.
3. Make a report of the employee's injury, illness, or death.

4. Receive the claims for the workers' compensation program.
5. Assist the employees and their survivors in preparing claims.

First, the laws provide the injured employees with income replacement. Second, these laws provide disabled workers with restoration of earnings. The third objective of these laws is to put economic pressure on employers to practice accident prevention. Fourth, the compensation law generally aims to assure proper allocation of societal cost by making the employer, not the taxpayer, responsible for them. The final hope of the drafters of these laws is the efficient achievement of the first four objectives.

Workers' compensation benefits are provided: (1) as replacement income for wages lost by employees because of their inability to work due to an occupational injury or illness and as financial remuneration for permanent loss of all or part of a bodily function, (2) for medical costs associated with an injury or illness from a job related exposure and (3) for rehabilitation following a job related debility. Most jurisdictions attempt to structure benefits so as to prevent workers from suffering economic hardship because of occupational injury or illness.

Workers' compensation was designed specifically to cover the cost of injuries arising out of the work environment, rather than to provide social assistance for accidents that occur outside the workplace. For this reason, certain basic requirements were established to define a "compensable injury," one for which a worker can collect compensation. The primary requirements accepted by all jurisdictions are that the injury must (1) arise out of employment (AOE), and (2) arise during the course of employment (COE).

Some occupational diseases and cumulative traumas have been disputed, based on these AOE or COE requirements. It is generally agreed that these illnesses, to be compensable, must arise out of employment and be due to causes or conditions characteristic of and peculiar to the particular trade, occupation, process, or employment. For example, a respiratory ailment that can be traced directly to a worker's exposure to harmful dust in the workplace could be treated as an occupational disease, and deafness resulting from repeated exposure to excessive workplace noise could be considered a cumulative trauma.

Ordinary diseases to which the general public is exposed (such as the flu or pneumonia) are specifically excluded. First, the incidence of cumulative trauma cases and awards has been increasing significantly in recent years. Second, medical research has suggested certain links between workplace conditions and medical problems that may not be apparent for many years (as with certain carcinogenic substances, which were not recognized as cancer-causing agents during the worker's period of employment).

The National Council on Compensation Injuries' (NCCI) basic manual is standard for all private insurance carriers. It establishes the Council's rules, procedures, and rates applicable to workers' compensation insurance. Because all states now have statutes regulating workers' compensation rates, the NCCI must file annually all proposed rate revisions and all supporting data with these authorities. In most states, public hearings must be held before the rates can be revised. These rate guide the insurance industries in assessing expected risk that is beneficial in determining the premiums that they will charge those securing workers' compensation coverage from them.

Commercial insurers are similar to other insurance companies except that they specialize in workers' compensation risk management. State funds are managed

by a low-bidding insurance company or a pool or companies for high-risk employers and employers who cannot afford to pay for commercial coverage.

Self-insureds are typically larger companies that can afford to set aside a pool of money to cover possible workers' compensation losses.

Job safety and health and your workers' compensation program, if effectively managed, can be the tools to cost reduction and efficiency on your construction jobsites. To reduce your workers' compensation cost is to reduce the pain and suffering which your workforce is experiencing. Any responsible employer, safety professional, or supervisor realizes that injured and ill workers are a problem that affects productivity, morale, and the bottom line. Thus, some effort must be expended to assure that your workers compensation program is meeting the needs of your company. This chapter is only an introduction to workers' compensation. You will need to expand your knowledge and understanding beyond the scope of this chapter.

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CHAPTER 6

OSHA'S ROLE AND RULES



PUBLIC LAW 91-596
91st Congress, S. 2193
December 29, 1970
As amended by Public Law 101-552,
§3101, November 5, 1990

An Act

To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to secure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Occupational Safety and Health Act of 1970."

The origination of the Occupational Safety and Health Administration by the OSHA Act. (Courtesy of the Occupational Safety and Health Administration.)

As an employer it is critical that you understand how the Occupational Safety and Health Administration (OSHA) works, achieves its mission, and strives to protect the American workforce. OSHA can be an ally or a thorn in your side depending upon your approach to job safety and health.

Workers should expect to go to work each day and return home uninjured and in good health. There is no logical reason that a worker should be part of workplace carnage. Workers do not have to become one of the yearly workplace statistics.

Employers who enforce the occupational safety and health rules and safe work procedures are less likely to have themselves or their workers become one of the 6,500 occupational trauma deaths, one of 90,000 occupational illness deaths, or even one of the 6.8 million nonfatal occupational injuries and illnesses that occur each year in the United States.

OSHA has been changing its role in recent years. Although still an enforcement agency, OSHA is working very hard at becoming a helpmate to employers. Its website is a tremendous resource. You should visit "<http://www.osha.gov>." If you have a question, you should call your regional or local office for answers. Your questions will not facilitate an inspection since OSHA would prefer to use its resources on those who are circumventing workplace safety and health rather than employers who are trying to solve workplace safety and health issues.

OSHA and its regulations should not be the driving force that ensures workplace safety and health. Since OSHA has limited resources and inspectors, enforcement is usually based on serious complaints, catastrophic events, and workplace fatalities. The essence of workplace safety and the strongest driving catalyst should first be the protection of the workforce, followed by economic incentives for the employer. Employers having a good safety and health program and record will reap the benefits: a better opportunity to win more customers; lower insurance premiums for workers' compensation; decreased liability; and, increased employee morale and efficiency. Usually safety and health are linked to the bottom line (company's income), which is seldom perceived as humanitarian.

This chapter will provide answers to many of the questions that are asked regarding OSHA and workplace safety and health and will suggest how employers and their workforce can work together to provide a safe and healthy workplace. This information is a guide to understanding OSHA, OSHA compliance, and ensuring safer and healthier worksites.

During the many years preceding OSHA, it became apparent that employers needed guidance and incentives to insure safety and health on the jobsite. The employer needed to realize that workers had a reasonable right to expect a safe and healthy workplace. This guidance and the guarantee of a safe and healthy workplace came to fruition with the enactment of the Occupational Safety and Health Act of 1970 (OSHA Act). The Occupational Safety and Health Administration was created by the Act to:

- Encourage employers and employees to reduce workplace hazards and to improve existing safety and health programs or implement new programs.
- Provide for research in occupational safety and health in order to develop innovative ways of dealing with occupational safety and health problems.
- Establish "separate-but-dependent" responsibilities and rights for employers and employees for the achievement of better safety and health conditions.
- Maintain a reporting and record-keeping system to monitor job-related injuries and illnesses.
- Establish training programs to increase the numbers and competence of occupational safety and health personnel.
- Develop mandatory job safety and health standards and enforce them effectively.
- Provide for the development, analysis, evaluation, and approval of state occupational safety and health programs.

Thus, the purpose of OSHA is to insure, as much as possible, a healthy and safe workplace free of hazardous conditions for workers in the United States.

OSHA STANDARDS

OSHA standards, found in the Code of Federal Regulations (CFR), include the standards for the following industry groups: construction; maritime; agriculture; the general industry which includes manufacturing, transportation and public utilities; wholesale and retail trades; finance; insurance, and service industrial sectors.

OSHA standards and regulations for occupational safety and health are found in Title 29 of the CFR and can be obtained through the Government Printing Office (GPO). The standards for specific industries are found in Title 29 of the CFR. In Appendix B you will find a summary of the regulations that are most likely to affect an office building and the safety and health within and around it. The 29 CFR 1910 is the regulations for General Industry and those under which office buildings fall.

An employer can seek relief (variance) from an OSHA Standard. The reasons for variances approved by OSHA are:

- The employer may not be able to comply with the standard by its effective date.
- The employer may not be able to obtain the materials, equipment or professional or technical assistance needed to comply.
- The employer already has processes or methods in place that provide protection to workers and are "at least as effective as" the standard's requirements.

There are two types of variances that can be applied for: temporary and permanent. These are usually needed when new regulations are promulgated.

PROTECTIONS UNDER THE OSHAct

Usually all employers and their employees are considered to be protected under the OSHAct, with the exception of:

- Self-employed persons.
- Farms where only immediate family members are employed.
- Workplaces already protected by other federal agencies under federal statutes such as the Department of Energy and the Mine Safety and Health Administration.
- State and local employees.

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

Although the formation of NIOSH was a requirement of the OSHAct of 1970, NIOSH is not part of OSHA. NIOSH is one of the Centers for Disease Control and Prevention, headquartered in Atlanta, Georgia. NIOSH reports to the Department of Health and Human Services (DHHS) and not to the Department of Labor (DOL) as OSHA does. Its functions are to:

- Recommend new safety and health standards to OSHA.
- Conduct research on various safety and health problems.
- Conduct health hazard evaluations (HHEs) of the workplace when called upon.
- Publish an annual listing of all known toxic substances and recommend exposure limits (RELs).
- Conduct training that will provide qualified personnel under the OSHAct.

An employer, worker's representative, or worker can request a health hazard evaluation from NIOSH to have a potential health problem investigated. It is best to use the NIOSH standard form. It can be obtained by calling 1-800-35-NIOSH. HHEs are problem-solving investigations and will not result in violations or fines since NIOSH is not an enforcement agency.

OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION (OSHRC)

The Occupational Safety and Health Review Commission (OSHRC) was established, under the OSHAct, to conduct hearings when OSHA citations and penalties are contested by employers or by their employees. As with NIOSH, the OSHRC formation was a requirement of the OSHAct but is a separate entity apart from OSHA.

EMPLOYER RESPONSIBILITIES UNDER THE OSHAct

The employer is held accountable and responsible under the OSHAct. The "General Duty Clause," Section 5(a)(1) of the OSHAct states that employers are obligated to provide a workplace free of recognized hazards that are likely to cause death or serious physical harm to employees. Employers must:

- Abide and comply with the OSHA standards.
- Maintain records of all occupational injuries and illnesses.
- Maintain records of workers' exposure to toxic materials and harmful physical agents.
- Make workers aware of their rights under the OSHAct.
- Provide, at a convenient location and at no cost, medical examinations to workers when the OSHA standards require them.
- Report within eight hours to the nearest OSHA office all occupational fatalities or catastrophes where three or more employees are hospitalized.
- Abate cited violations of the OSHA standard within the prescribed time period.
- Provide training on hazardous materials and make MSDSs, such as hazard communication training, available to workers upon request.
- Assure workers are adequately trained under the regulations.

- Post information required by OSHA such as citations, hazard warnings and injury/illness records.

WORKERS' RIGHTS AND RESPONSIBILITIES UNDER THE OSHAct

Workers have many rights under the OSHAct. These rights include the right to:

- Review copies of appropriate standards, rules, regulations, and requirements that the employer should have available at the workplace.
- Request information from the employer on safety and health hazards in the workplace, precautions that may be taken, and procedures to be followed if an employee is involved in an accident or is exposed to toxic substances.
- Access relevant worker exposure and medical records.
- Be provided personal protective equipment (PPE).
- File a complaint with OSHA regarding unsafe or unhealthy workplace conditions and request an inspection.
- Not be identified to the employer as the source of the complaint.
- Not be discharged or discriminated against in any manner for exercising rights under the OSHAct related to safety and health.
- Have an authorized employee representative accompany the OSHA inspector and point out hazards.
- Observe the monitoring and measuring of hazardous materials and see the results of the sampling, as specified under the OSHAct and as required by OSHA Standards.
- Review the occupational injury and illness records (OSHA No. 200 or equivalent) at a reasonable time and in a reasonable manner.
- Have safety and health standards established and enforced by law.
- Submit to NIOSH a request for a Health Hazard Evaluation (HHE) of the workplace.
- Be advised of OSHA actions regarding a complaint and request an informal review of any decision not to inspect or issue a citation.
- Participate in the development of standards.
- Speak with the OSHA inspector regarding hazards and violations, during the inspection.
- File a complaint and receive a copy of any citations issued and the time allotted for abatement.
- Be notified by the employer if the employer applies for a variance from an OSHA standard and testify at a variance hearing and appeal the final decision.
- Be notified if the employer intends to contest a citation, abatement period, or penalty.

- File a Notice of Contest with OSHA if the time period granted to the company for correcting the violation is unreasonable, provided it is contested within fifteen working days of the employer's notice.
- Participate at any hearing before the OSHA Review Commission or at any informal meeting with OSHA when the employer or a worker has contested an abatement date.
- Appeal the OSHRC's decisions in the U. S. Court of Appeals.
- Obtain a copy of the OSHA file on a facility or workplace.

Along with rights go responsibilities and workers should be expected to conform to these responsibilities. Workers are expected to:

- Comply with the OSHA Regulations and Standards.
- Not remove, displace, or interfere with the use of any safeguards.
- Comply with the employer's safety and health rules and regulations.
- Report any hazardous conditions to the supervisor or employer.
- Report any job-related injuries and illnesses to the supervisor or employer.
- Cooperate with the OSHA Inspector during inspections when requested to do so.

One point that should be kept in mind is that it is the employer's responsibility to assure that employees comply with OSHA regulations and their safety and health rules. Workers are not held financially accountable by OSHA for violations of OSHA regulations. It is entirely up to the employer to hold employees accountable. With the accountability and responsibility falling upon the employer, he or she must take control and direct the safety and health effort at the workplace.

DISCRIMINATION AGAINST WORKERS

Workers have the right to expect safety and health on the job without fear of punishment. This is spelled out in Section 11(c) of the OSHAct and under 49 U.S.C. 31105 (Formerly Section 405) for the trucking industry. The law states that employers shall not punish or discriminate against workers for exercising rights such as:

- Complaining to an employer, union, or OSHA (or other government agency) about job safety and health.
- Filing a safety and health grievance.
- Participating in OSHA inspections, conferences, hearings, or OSHA related safety and health activities.

If workers believe they are being discriminated against, they should contact the nearest OSHA office within 30 days of the time they sense that discriminatory activity started. To file a formal complaint workers should visit, call, or write their nearest OSHA office or state OSHA office, if a state program exists there. If workers call or visit, then a written follow-up letter should be sent. This may be the only documentation of a complaint. Complaints should be filed only when the following is occurring:

- Discrimination has been continuing.
- The employer has been devious, misleading, or has been concealing information regarding the grounds for the worker's discriminatory treatment.
- The worker has attempted to use the grievance or arbitration procedures under the collective bargaining agreement during the 30 days.

When OSHA receives a Worker's Discrimination Complaint, OSHA will review the facts of the complaint and decide whether to conduct an investigation. If an investigation ensues, the worker and the employer will be notified of the results within 90 days.

If the investigation indicates the worker's case has merit to process the case through the courts, OSHA or the state agency will attempt to negotiate with the employer. The settlement might include reinstatement of the worker's job, full back pay, and purging of the worker's personnel records. The employer might also be required to post a notice on the jobsite warning about any further workplace safety and health discrimination.

At times employers may not decide not to settle. In this instance, OSHA or the state agency will submit the case to the U.S. District Court. The court can order the employer to reinstate the employee, pay lost wages, purge the worker's personnel records, and protect him or her from further discrimination.

If the investigation determines the worker does not have a case, the worker may feel the decision was in error and may appeal the decision of OSHA or the State Agency. The worker will need to provide a detailed explanation, as well as documentation, for contesting the prior decision.

Workers can file a discrimination complaint with federal OSHA if the worker's state program and its courts do not offer protection from discrimination.

RIGHT TO INFORMATION

The Hazard Communication Standard (29 CFR 1910.1200) provides workers with a "right-to-know." This means that the employer must establish a written, comprehensive hazard communication program that includes provisions for container labeling, materials safety data sheets and an employee training program. The program must include:

- A list of the hazardous chemicals in the workplace.
- The means the employer uses to inform employees of the hazards of non-routine tasks.
- The way the employer will inform other employers of the hazards to which their employees may be exposed.

Workers have the right to information regarding the hazards to which they are or will be exposed. They have the right to review plans such as the hazard communication plan. They have a right to see a copy of a MSDS during their shift and receive a copy of a MSDS when requested. Also, information on hazards that may be brought to the workplace by another employer or their employees should be available to workers. Other forms of information such as exposure records, medical records, etc. are to be made available to workers upon request.

OSHA INSPECTIONS

OSHA has the right to conduct workplace inspections as part of its enforcement mandate. OSHA can routinely initiate an unannounced inspection of a business. Other inspections occur due to fatalities/catastrophes, routine program inspections, or by referrals and complaints. These occur during normal working hours.

Workers have the right to request an inspection. The request should be in writing, either by letter or by using the OSHA Complaint Form to identify the employer and the alleged violations. Send the letter or form to the area director or state OSHA director. If workers receive no response, they should contact the OSHA regional administrator. It is beneficial to call the OSHA office to verify its normal operating procedures. If workers allege an imminent danger, they should call the nearest OSHA office.

These inspections include: checking company records, reviewing the compliance with the hazard communication standard, fire protection, personal protective equipment, and review of the company's health and safety plan. This inspection will include conditions, structures, equipment, machinery, materials, chemicals, procedures, and processes. OSHA's priorities for scheduling an inspection are rank-ordered as follows:

- Situations involving imminent danger.
- Catastrophes or fatal accidents.
- Complaints by workers or their representatives.
- Referral from other state/federal agencies or media.
- Regular inspections targeted at high-hazard industries.
- Follow-up inspections.

Usually no advance notice is given to an employer prior to an inspector appearing at a jobsite. But there are times when advance notice is an acceptable practice. They are:

- In case of an imminent danger.
- When it would be effective to conduct an inspection after normal working hours.
- When it is necessary to assure the presence of the employer or a specific employer or employee representatives.
- When the area director determines that an advance notice would enhance the probability of a more thorough and effective inspection.

No inspection will occur during a strike, work stoppage, or picketing action unless the area director approves such action. Usually this type of inspection would be due to extenuating circumstances such as an occupational death inside the facility. The steps of an OSHA inspection encompass:

- The inspector becoming familiar with the operation including previous citations, accident history, business demographics and gaining entry to the operation. OSHA is forbidden to make a warrantless inspection without the employer's consent. Thus, the inspector may have to obtain a search warrant if reasonable grounds for an inspection exist and entry has been denied by the employer.

- The inspector holding an opening conference with the employer or a representative of the company. It is required that a representative of the company be with the inspector during the walk-around and a representative of the workers be given the opportunity to accompany the inspector.
- An inspection tour taking hours or possibly days, depending on the size of the operation. The inspector usually covers every area within the operation while assuring compliance with OSHA regulations.
- A closing conference is conducted that gives the employer an opportunity to review the inspector's findings. The inspector will request from the employer an abatement time for the violation(s) to be corrected. An employee representative (union) will also be afforded an opportunity to have a separate opening and closing conference.
- The area director will issue, to the employer, the written citations with proposed penalties and abatement dates. This document is called "Notification of Proposed Penalty."

WORKERS' COMPLAINTS AND REQUESTS FOR INSPECTIONS

Requesting an OSHA inspection is a right, which should be used in a prudent and responsible manner and only after all other options have been exhausted. Workers' complaints are the most frequent reason for OSHA inspections.

When OSHA receives a complaint, OSHA gathers information concerning the complaint and decides whether or not the complaint warrants sending a compliance officer (inspector) to the site.

CITATIONS, PENALTIES, AND OTHER ENFORCEMENT MEASURES

If violations of OSHA standards are detected during an inspection, the citations will include the following information:

- The violation.
- The workplace affected by the violation.
- Specific control measures to be taken.
- The abatement period or time allotted to correct the hazard.

Upon receipt of the penalty notification, the employer has 15 working days to submit a Notice of Contest that must be given to the workers' authorized representative or, if no representative exists, it must be posted in a prominent location in the workplace. During the 15 days, it is recommended that the employer first request an informal conference with the area director. During the informal conference the issues concerning the citations and penalties can be discussed. If the employer is not satisfied, a Notice of Contest can be filed. An employer who has filed a Notice of Contest may withdraw it prior to the hearing date by:

- Showing that the alleged violation has been abated or will be abated.
- Informing the affected employees or their designated representative of the withdrawal of the contest.

- Paying the assessed fine for the violation.

Copies of the citation should be posted near the violation’s location for at least three days or until the violation is abated, whichever is longer. Violations are categorized in the following manner (Table 6-1).

Table 6-1	
OSHA Violations and Penalties	
<i>De Minimis</i>	No Penalty
Other than Serious	Up to \$7,000 per violation
Serious	\$1,500 - \$7,000 per violation
Willful, No Death	Up to \$70,000 per violation (minimum of \$5,000)
Willful, Repeat Violations	Same as Willful, No Death
Willful, Death Results	Up to \$250,000, or \$500,000 for a corporation, and six months in jail
Willful, Death Results, Second Violation	\$250,000 and one year in jail
Failure to Correct a Cited Violation	\$7,000/day until abated
Failure to Post Official Documents	\$7,000 per poster
Falsification of Documents	\$10,000 and six months in jail
Assaulting a Compliance Officer	Not more than \$5,000 and not more than three years imprisonment

In describing these violations, the *de minimis* is the least serious and carries no penalty since it violates a standard that has no direct or immediate relationship to safety and health. An other-than-serious violation would probably not cause death or serious harm, but could have a direct effect on the safety or health of employees. Serious violations are those violations where a substantial probability of death or serious physical harm could result. The willful violations are violations where an employer has deliberately, voluntarily, or intentionally violated a standard. And, repeat violations are ones that occur within three years of an original citation. The values or penalties applied to citations are based upon four criteria:

- The seriousness or gravity of the alleged violation.
- The size of the business.
- The employer’s good faith in genuinely and effectively trying to comply with the OSHAct before the inspection and, during and after the inspection, making a genuine effort to abate and comply.

- The employer’s history of previous violations.

Employers can contest either the citation or the penalty by requesting an informal hearing with the area director to discuss these issues, and the area director can enter into a settlement agreement if the situation merits it. But, if a settlement cannot be reached, the employer must notify the area director, in writing, by a Notice of Contest of the citation, penalties, or abatement period within 15 days of receipt of the citation.

COMMONLY ISSUED VIOLATIONS FOUND BY OSHA

No matter what type of work your company is involved in, you should be aware of the types of violation that OSHA has found during inspection. Also, you need to know which violations are cited the most so that you can put emphasis on assuring that these violations do not exist in your workplace. In Table 6-2 you can find a listing of the most cited violations by OSHA for finance, insurance, and real estate. Office buildings are not inspected by OSHA on a frequent basis unless there is a problem identified or reported. From Table 6-2 you can see that both general industry (29 CFR 1910) and construction (29 CFR 1926) violations were cited. These are the most representative violations OSHA issues for office buildings.

Table 6-2		
Division H—Finance, Insurance, and Real Estate (SIC 60-67)		
CFR Standard	#Cited	Description
1910.1200	52	Hazard Communication
1926.1101	43	Asbestos
1910.134	32	Respiratory Protection
1910.1001	28	Asbestos Tremolite, Anthophyllite & Actinolite
1910.146	21	Permit-Required Confined Spaces
1910.305	16	Electrical, Wiring Methods, Components & Equipment
1910.37	14	Means of Egress, General
1910.147	14	The Control of Hazardous Energy, Lockout Tagout
1910.36	13	Means of Egress, General Requirements
1910.157	12	Portable Fire Extinguishers
1910.184	11	Slings
1910.141	9	Sanitation
1910.1047	9	Ethylene Oxide
1910.132	8	Personal Protective Equipment, General Requirements
1926.62	8	Lead
5A1	7	General Duty Clause (Section of OSHA Act)
1910.303	7	Electrical Systems Design, General Requirements

1910.142	6	Temporary Labor Camps
1910.333	6	Electrical, Selection & Use of Work Practices
1926.651	6	Excavations, General Requirements
1910.23	5	Guarding Floor & Wall Openings & Holes
1910.106	5	Flammable & Combustible Liquids
1904.2	4	Log & Summary of Occupational Injuries & Illnesses
1910.22	4	Walking-Working Surfaces, General Requirements
1910.219	4	Mechanical Power-Transmission Apparatus
1910.304	4	Electrical, Wiring Design & Protection
1910.1020	4	Access to Employees Exposure and Medical Records
1910.1030	4	Bloodborne Pathogens
1926.501	4	Fall Protection Scope/Applications/Definitions
1926.1053	4	Ladders
1904.8	3	Fatality/Multiple Hospitalization Accident Reporting
1910.68	3	Manlifts
1910.120	3	Hazardous Waste Operations & Emergency Response
1910.179	3	Overhead & Gantry Cranes
1910.215	3	Abrasive Wheel Machinery
1926.20	3	Construction, General Safety & Health Provisions
1926.602	3	Material Handling Equipment
1926.652	3	Excavations, Requirements For Protective Systems
1910.24	2	Fixed Industrial Stairs
1910.25	2	Portable Wood Ladders
1910.28	2	Safety Requirements For Scaffolding
1910.135	2	Occupational Head Protection
1910.178	2	Powered Industrial Trucks (Forklifts)
1910.334	2	Electrical, Use of Equipment
1910.1052	2	Methylene Chloride
1926.21	2	Construction, Safety Training & Education
1926.100	2	Head Protection
1926.304	2	Woodworking Tools
1926.503	2	Fall Protection Training Requirements
1926.1052	2	Stairways

OSHA REGULATIONS

It is helpful to have some understanding of how regulations/standards come about and how you can make use of them when needs arise. This section is a summary regarding OSHA regulations. You can find the text for any OSHA regulation at

the OSHA website or in a copy of the Code of Federal Regulations usually 29 CFR 1910 for your use.

The Occupational Safety and Health Administration (OSHA) was mandated to be formed by the Occupational Safety and Health Act of 1970 (OSHAct). Congress gave OSHA a mandate to develop regulations/standards to protect the American worker. Not only was OSHA to develop these regulations, but, it was to implement (promulgate) them and enforce them to protect a valuable entity (the American worker). OSHA has no choice but to follow the mandate provided by Congress. Over the years OSHA has gone from strictly an enforcement agency to an agency bent upon trying to help employers comply with its regulations.

Few, if any, regulations are developed, implemented, and enforced unless there have been deaths, injuries, or illnesses which can be attributable to activities within the workplace. A great number of deaths and a great deal of bleeding and carnage attributed to a certain hazard usually precede the development of any regulation. Regulations are not developed without much justification. In fact, the regulatory process is long and laborious. The development of a new regulation usually takes years. One of the fastest regulations to be developed and implemented was the Blood-borne Pathogen Standard because everyone was frightened by the possibility of contracting AIDS or Hepatitis B.

In order to have a good safety and health effort in your workplace, you need to be familiar with what you need to know in order to be able to come into compliance with the regulations that affect your office-building environment. All of the regulations found in the Code of Federal (CFR) will not apply to your operation. For instance, you will not be particularly interested in the commercial diving regulation if you do not conduct diving operations or have no divers employed.

This section is meant to help you learn about regulations and how to use them to insure that your safety and health effort is proceeding in the right direction and is lawful.

Federal Laws

Congress establishes federal laws (legislation or acts) and the President signs them into law. These laws often require that regulations (standards) be developed by the federal agencies responsible for the intent of the law.

OSHAct

The Occupational Safety and Health Act (OSHAct) of 1970 is such a law and is also called the Williams-Steiger Act. It was signed by President Richard Nixon on December 29, 1970 and became effective April 29, 1971. The OSHAct was not amended until November 5, 1990 by Public Law 101-552. The OSHAct assigned the responsibility of implementing and enforcing the law to a newly created agency, the Occupational Safety and Health Administration (OSHA), located in the Department of Labor (DOL).

Most such federal laws (acts) contain the following content or elements:

1. The reason for the law.
2. A statement of the national policy related to the law.
3. Objectives/goals/outcomes expected of the law.

4. Authorization of the agency responsible for implementation.
5. Requirements and structure of the regulations to be developed.
6. Time frames for regulation, implementation, or deadlines.
7. Enforcement guidelines to be followed.
8. Fines or assessments available to the enforcing agency.
9. Specific actions required by the law.

Prior to the OSHAct there were some state laws, a few pieces of federal regulations, and a small number of voluntary programs by employers. Most of the state programs were limited in scope and the federal laws only partially covered workers.

Another important reason for the OSHAct was the increasing number of injuries and illnesses within the workplace. Thus, the OSHAct was passed with the express purpose of assuring that every working man and woman in the nation would be provided safe and healthful work conditions while preserving this national human resource: the American worker. The OSHAct is divided into sections with each having a specific purpose. The full text of the OSHAct, all thirty-one pages, can be obtained from your local OSHA office or on the OSHA website.

The Regulatory Process

OSHA received a mandate to develop, implement, and enforce regulations relevant to workplace safety and health and the protection of workers. Time constraints prevented the newly formed OSHA from developing brand new regulations. Therefore, OSHA adopted previously existing regulations from other government regulations, consensus standards, proprietary standards, professional groups standards, and accepted industry standards. This is the reason that today the hazardous chemical exposure levels, with a few exceptions, are the same as the existing threshold limit values (TLVs) published by the American Congress of Government Industrial Hygienists in 1968. Once these TLVs were adopted, it became very difficult to revise them. Even though research and knowledge in the past 30 years has fostered newer and safer TLVs, these TLVs have not been adopted by OSHA.

As stated previously, the original OSHA standards and regulations have come from three main sources: consensus standards, proprietary standards, and federal laws that existed when the Occupational Safety and Health Act became law.

Consensus standards are developed by industry-wide standard-developing organizations and are discussed and substantially agreed upon through industry consensus. OSHA has incorporated into its standards the standards of two primary groups: the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA). As an example, ANSI A10.33, Safety and Health Program Requirements for Multi-Employer Projects, covers minimum elements and activities of a program. It also defines the duties and responsibilities of the individual construction employers who will be working on a construction project.

Another example comes from the NFPA standards. NFPA No. 30-1969, Flammable and Combustible Liquids Code, was the source standard for CFR Part 1910, Section 106. It covers the storage and use of flammable and combustible liquids that have flash points below 200°F.

Proprietary standards are prepared by professional experts within specific industries, professional societies, and associations. The proprietary standards are determined by a straight membership vote, not by consensus. An example of these standards can be found in the *Compressed Gas Association, Pamphlet P-1, Safe Handling of Compressed Gases*. This proprietary standard covers requirements for safe handling, storage, and use of compressed gas cylinders.

Some of the pre-existing federal laws that are enforced by OSHA include: the Federal Supply Contracts Act (Walsh-Healy), the Federal Service Contracts Act (McNamara-O'Hara), the Contract Work Hours and Safety Standard Act (Construction Safety Act), and the National Foundation on the Arts and Humanities Act. Standards issued under these acts are now enforced in all industries where they apply.

When OSHA needs to develop a new regulation or even revise an existing one, it becomes a lengthy and arduous process. This is why it took so long to get the following regulations passed:

- Process Chemical Safety Standard—7 years
- Hazard Communications Standard—10 years
- Lockout/Tagout Standard—12 years (still does not apply to construction)
- Confined Spaces—17 years (still does not apply to construction)

But, it took only three years to get a new regulation passed covering lift-slab construction after the collapse of L'Ambience Plaza in Bridgeport, CT where 28 workers died. Also, only a short period of time lapsed in getting a bloodborne pathogen standard when people were scared to death of HIV (AIDS) and Hepatitis B virus (HBV).

Standards are sometimes referred to as being either “horizontal” or “vertical” in their application. Most standards are “horizontal” or “general.” This means they apply to any employer in any industry. Fire protection, working surfaces, and first aid standards are examples of “horizontal” standards.

Some standards are relevant to only a particular industry and are called “vertical” or “particular” standards. Examples of these standards applying to the construction industry, the longshoring industry, and special industries are covered in Subpart R of 29 CFR 1910.

Through the newspapers and conversations, it certainly sounds as if OSHA is producing new standards each day that will impact the workplace. This simply is not true. The regulatory process is very slow. Why in some cases is the time so long and others so short? Aren't the same steps followed for each regulation? The answer is yes, the process is the same, but at each step the time and the stumbling blocks may not be the same. The steps are as follow:

1. The agency (OSHA) opens a Regulatory Development Docket for a new or revised regulation.
2. This indicates that OSHA believes a need for a regulation exists.
3. An Advanced Notice of Proposed Rulemaking (ANPRM) is published in the Federal Register and written comments are requested to be submitted within 30-60 days.
4. The comments are analyzed.

5. A Notice of Proposed Rulemaking (NPRM) is published in the *Federal Register* with a copy of the proposed regulation.
6. Another public comment period transpires, usually for 30–60 days.
7. If no additional major issues are raised by the comments, the process continues to step 10.
8. If someone raises some serious issues, the process goes back to step 4 for review and possible revision of the NPRM.
9. Once the concerns have been addressed, it continues forward to steps 5 and 6 again.
10. If no major issues are raised, a Final Rule (FR) will be published in the *Federal Register*, along with the date when the regulation will be effective (usually 30–120 days).
11. There can still be a Petition of Reconsideration of the Final Rule. There are times when an individual or industry may take legal action to bar the regulations promulgation.
12. If the agency does not follow the correct procedures or acts arbitrarily or capriciously, the court may void the regulation and the whole process will need to be repeated.

If you desire to comment on a regulation during the development process, feel free to do so; your comments are important. You should comment on the areas where you agree or disagree. This is your opportunity to speak up. If no one comments, it is assumed that nobody cares one way or the other. You must be specific. Give examples, be precise, give alternatives, and provide any data or specific information that can back up your opinion. Federal agencies always welcome good data, which substantiates your case. Cost/benefit data is always important in the regulatory process and any valid cost data that you are able to provide may be very beneficial. But, make sure that your comments are based upon what is published in the *Federal Register* and not based upon hearsay information. Remember that the agency proposing the regulation may be working under specific restraints. Make sure you understand these constraints. Due to restrictions the agency may not have the power to do what you think ought to be done.

Sometimes the agency feels that there is not a need for the proposed regulation, but it has been mandated to develop it. Your comments could be useful in stopping the development of this regulation. Just be sure your comments are polite, not demeaning or combative. Remember an individual has worked on this proposed regulation and is looking for constructive and helpful comments. Even if you are against this regulation, do not let your comments degenerate to a personal level. Focus on the regulation, not individuals.

The Federal Register

The *Federal Register* is the official publication of the United States Government. If you are involved in regulatory compliance, you should obtain a subscription to the *Federal Register*. The reasons for obtaining this publication are clear. It is official, comprehensive, and not a summary done by someone else. It is published daily and provides immediate accurate information. The *Federal Register* provides

early notices of forthcoming regulations, informs you of comment periods, and gives the preamble and responses to questions raised about a final regulation. It provides notices of meetings, gives information on obtaining guidance documents, and supplies guidance on findings, on cross references, and gives the yearly regulatory development agenda. It is the “bible” for regulatory development. It is published daily and is recognizable by brown paper and newsprint quality printing (see Figure 6-1).

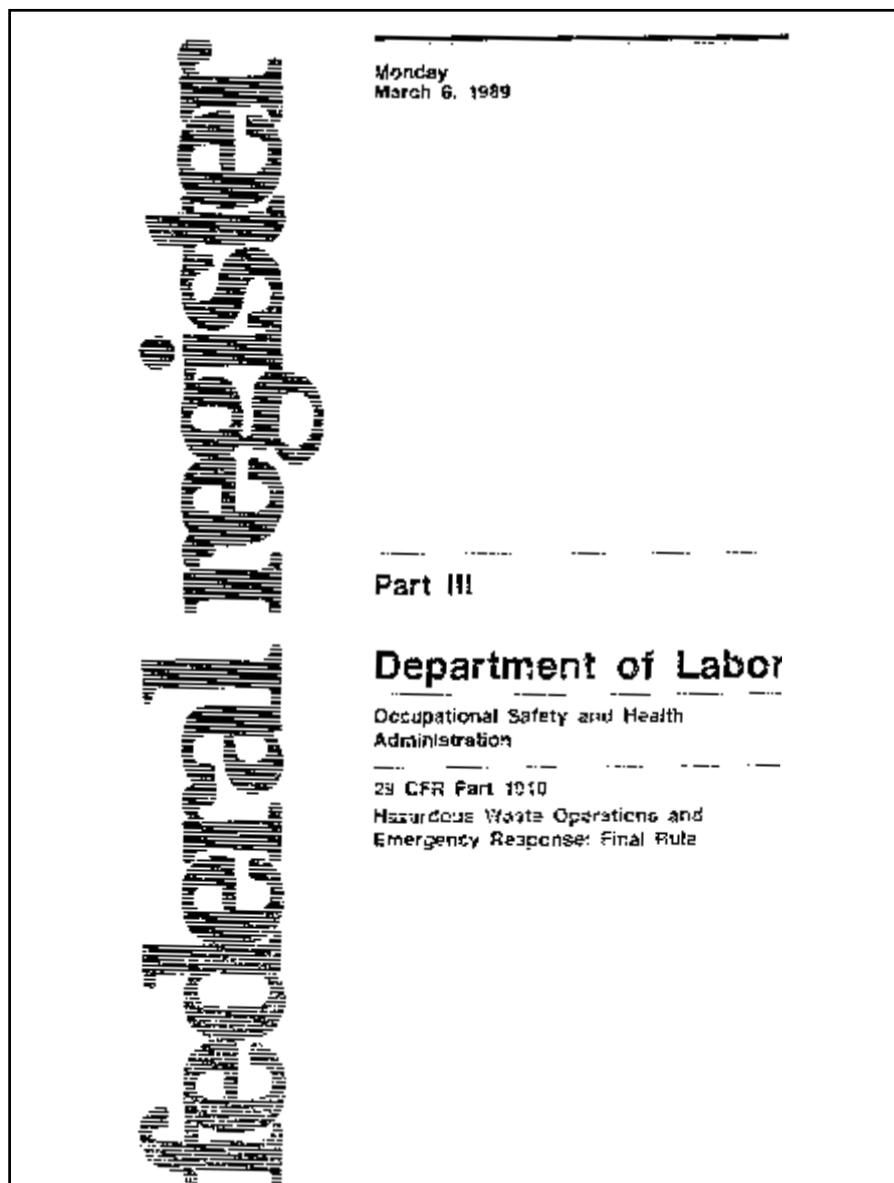


Figure 6-1. *The Federal Register*. (Courtesy of the Occupational Safety and Health Administration.)

Code of Federal Regulations

Probably one of the most common complaints from people who use the U.S. Code of Federal Regulations is, “How do you wade through hundreds of pages of standards and make sense out of them?” From time to time you may have experienced this frustration and been tempted to throw the standards in the “round file.”

The Code of Federal Regulations (CFR) is a codification of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the federal government. The code is divided into 50 titles that represent broad areas that are subject to federal regulations. Each title is divided into chapters, which usually bear the name of the issuing agency. Each chapter is further subdivided into parts covering specific regulatory areas. Based on this breakdown, the Occupational Safety and Health Administration is designated Title 29—Labor, Chapter XVII (Occupational Safety and Health Administration) and Part 1926 for the Construction Industry Sector. The CFR related to occupational safety and health for specific industries are as follows in Table 6-3.

Table 6-3
CFRs for Industry-Specific Regulations
<ul style="list-style-type: none">• General Industry—29 CFR PART 1910• Shipyard Employments—29 CFR 1915• Marine Terminals—29 CFR 191• Longshoring—29 CFR PART 1918• Gear Certification—29 CFR PART 1919• Construction—29 CFR PART 1926• Agriculture—29 CFR PART 1928• Federal Agencies—29 CFR 1960

Each volume of the CFR is revised at least once each calendar year and issued on a quarterly basis. OSHA issues regulations at the beginning of the fourth quarter, or July 1st of each year (the approximate revision date is printed on the cover of each volume) (see Figure 6-2).

The CFR is kept “up-to-date” by individual revisions issued in the *Federal Register*. These two publications (the CFR and the *Federal Register*) must be used together to determine the latest version of any given rule.

To determine whether there have been any amendments since the revision date of the CFR volume in which you are interested, the following two lists must be consulted: The “Cumulative List of CFR Sections Affected,” issued monthly; and the “Cumulative List of Parts Affected,” appearing daily in the *Federal Register*. These two lists refer you to the *Federal Register* page where you may find the latest amendment of any given rule. The pages of the *Federal Register* are numbered sequentially from January 1 to January 1 of the next year.

As stated previously, Title 29, Chapter XVII has been set aside for OSHA. Chapter XVII is broken down into parts which are further broken down into subparts, sections, and paragraphs.



Figure 6-2. Code of Federal Regulations. (Courtesy of the Occupational Safety and Health Administration.)

Regulation Paragraph Number System

In order to use the Code of Federal Regulations, you need an understanding of the hierarchy of the paragraph numbering system. The numbering system is a mixture of letters and numbers. Prior to 1979, italicized small case letters and small case roman numerals were used. A change was made after 1979.

CFR Numbering Hierarchy	
<1979	1980
(a)	(a)
(1)	(1)
(i)	(i)
<hr/>	
Italicized (a)	(A)
Italicized (1)	{ 1 }
Italicized (i)	(i)

When trying to make use of the regulations, having knowledge of the regulatory numbering system will help remove a lot of the “headaches.” This should make them easier to comprehend and more user friendly. The following illustrates and explains the numbering system using an example from 29 CFR 1910.110.

29 CFR 1910.110 (b)(13)(ii)(b)(7)(iii)

Portable containers shall not be taken into buildings except as provided in paragraph (b)(6)(i) of this section.

<u>Title</u>	<u>Code of Fed. Reg.</u>	<u>Part</u>	<u>Subpart</u>	<u>Section</u>	<u>Paragraph</u>
29	CFR	1910	D	.110	

As can be seen from this example, the first number (29) stands for the Title. Next comes CFR, which of course stands for the Code of Federal Regulations, followed by 1910 which is the Part 1910. Finally, there is a period which is followed by an Arabic number. This will always be the section number. In this case Section .110 is the handling and storage of liquefied petroleum gas regulation. If the number had been .146, the section would pertain to permit-required confined spaces.

29 CFR 1910.110 (b)(13)(ii)(b)(7)(iii)

Portable containers shall not be taken into buildings except as provided in paragraph (b)(6)(i) of this section.

<u>Title</u>	<u>Code of Fed. Reg.</u>	<u>Part</u>	<u>Subpart</u>	<u>Section</u>	<u>Paragraph</u>
29	CFR	1910	D	.110	(b)

This means that the next breakdown of paragraphs will be sequenced by using lower case letters in parentheses (a), (b), (c), etc. If you had three major paragraphs of information under a section, they would be lettered .110(a), .110(b), and .110(c).

29 CFR 1910.110 (b)(13)(ii)(b)(7)(iii)

Portable containers shall not be taken into buildings except as provided in paragraph (b)(6)(i) of this section.

Title	Code of Fed. Reg.	Part	Subpart	Section	Paragraph
29	CFR	1910	D	.110	(b)(13)

The next level of sequencing involves the use of Arabic numerals. As illustrated, if there were three paragraphs of information between subheadings (a) and (b), they would be numbered (a)(1), (a)(2), and (a)(3).

29 CFR 1910.110 (b)(13)(ii)(b)(7)(iii)

Portable containers shall not be taken into buildings except as provided in paragraph (b)(6)(i) of this section.

Title	Code of Fed. Reg.	Part	Subpart	Section	Paragraph
29	CFR	1910	D	.110	(b)(13)(ii) (b)(7)(iii) <i>Italicized</i>

The next level uses lower case Roman numerals. An example would be between paragraphs (2) and (3). If there were five paragraphs of information pertaining to Arabic (2) they would be numbered (2)(i), (2)(ii), (2)(iii), (2)(iv) and (2)(v).

If there are subparagraphs to the lower case roman numerals and the regulation was developed and implemented prior to 1979 as is the case, then an italicized lower case letter is used such as (a), (b).....(c) as in the case for this example. Any other subparagraph falling under the italicized lower case letter will be an italicized number such as (1), (5),.....(8) and subparagraphs to the italicized number are italicized lower case Roman numerals such as (i), (ii).....(iii).

After 1979 the subparagraphs under the lower case Roman numerals became upper case letters such as (A), (B),.....(C). Any other subparagraph falling under an upper case letter is numbered using brackets, for example {1}, {5}.....{23}, and any subparagraph to the bracketed numbers would be denoted by an italicized Roman numeral as follows: (i), (iv).....(ix).

If you are not using the OSHA website to access a copy of the OSHA regulations, you may have a copy of the CFR, which has a poor table of contents and a fair index, to help you to find information in a quick fashion. I usually have my students place a labeled tab at the beginning of each subpart (A-Z); then I have them use a highlighter marking each section, major paragraphs, and subparagraphs. This will make using and finding information in your CFR easier.

The general industry and construction standards, 29 CFR 1910 and 1926, are divided into 26 subparts lettered A through Z. In Appendix B, each subpart that may be applicable to office buildings will be highlighted with an overview paragraph, a listing of all the sections in it, and a short checklist to assist you in deciding

which subparts of these regulations apply to your type of work. If you check an entry on a subpart then you will need to comply with part or all of that subpart.

This section should help you understand the OSHA regulations and how they are set up and how they might apply to your operation. If you have questions related to what a regulation means or if it applies to you, you should call OSHA and ask for clarification. Do not be afraid to call OSHA. They are not taking names and numbers. OSHA representatives would prefer to answer your questions than to have to visit your facility or conduct an inspection of your facility. OSHA representatives will advise you regarding the application of a regulation to your workplace. But, remember the final responsibility to comply with OSHA regulations rests with you.

STATE OSHA PLANS

Most state plans provide for the state to take over the enforcement of workplace safety and health rather than to have federal OSHA perform this service within the state. A listing of the federal and state office addresses and telephone numbers can be found in Appendix C. Many states have opted to take on this responsibility.

The states of Connecticut, New Jersey, and New York have unique plans in that they cover only state and local employees (public sector), while federal OSHA covers the general and construction industries. If a state has a federally approved plan or program, the following conditions must exist:

- The state must create an agency to carry out the plan.
- The state's plan must include safety and health standards and regulations. The enforcement of these standards must be at least as effective as the federal plan.
- The state plan must include provisions for right of entry and inspection of the workplace, including a prohibition on advance notice of inspections.
- The state's plan must also cover state and local government employees.

If a state has a plan, are there state-specific standards and regulations? The answer is "yes," and they must be at least as stringent as the federal standards and regulations. Some states have standards and regulations that go beyond the requirements of the existing federal standards and regulations, while others simply adopt the federal standards and regulations verbatim.

Anyone who feels their state program has not responded to requests for inspections, complaints of discrimination, or appeals on citations or variances, can file a complaint with federal OSHA. Federal OSHA is responsible to monitor state programs and make evaluations on their effectiveness.

WORKER TRAINING

Many standards promulgated by OSHA specifically require the employer to train employees in the safety and health aspects of their jobs. Other OSHA standards make it the employer's responsibility to limit certain job assignments to employees who are "certified," "competent," or "qualified"—meaning that employees have had

special previous training, in or out of the workplace. OSHA regulations imply that an employer has assured that a worker has been trained prior to being designated as the individual to perform a certain task.

In order to make a complete determination of the OSHA requirement for training, one would have to go directly to the regulation that applies to the specific type of activity. The regulation may mandate hazard training, task training, and length of the training, as well as specifics to be covered by the training. A good source of training requirements has been produced by OSHA. It can be found on the OSHA website and is titled, *Training Requirements in OSHA Standards and Training Guidelines* (OSHA 2254).

It is always a good idea for the employer, as well as the worker, to keep records of training. These records may be used by a compliance inspector during an inspection, after an accident resulting in injury or illness, as a proof of good intentions by the employer or to comply with training requirements for workers including new workers and those assigned new tasks.

OCCUPATIONAL INJURIES AND ILLNESSES

Although most office operations are not required by OSHA to recording and reporting of occupational injuries and illness, the requirements can be found in 29 CFR part 1904 —Recording and Reporting Occupational Injuries and Illnesses. This regulation has been revised and goes into effect as of January 2002. These requirements are summarized in the following paragraphs.

Any illness that has been caused by exposure to environmental factors such as inhalation, absorption, ingestion, or direct contact with toxic substances or harmful agents and has resulted in an abnormal condition or disorder that is acute or chronic is classified as an occupational disease. Repetitive motion injuries are also included in this category. All illnesses are recordable, regardless of severity. Injuries are recordable when:

- An on-the-job death occurs regardless of length of time between injury and death.
- One or more lost workdays occurred.
- Restriction of work or motion transpires.
- Loss of consciousness occurs.
- Worker is transferred to another job.
- Worker receives medical treatment beyond first aid (see Figure 6-3).

Employers with more than ten employees are required to complete and maintain occupational injury and illness records. The OSHA 301 "Injury and Illness Incident Report," or equivalent, must be completed within seven days of the occurrence of an injury at the worksite and the OSHA 301 must be retained for five years. Also the OSHA 300 "Log of Work-Related Injuries and Illnesses" is to be completed within seven days when a recordable injury or illness occurs and maintained for five years. The OSHA 300A "Summary of Work-Related Injuries and Illnesses" must be posted yearly from February 1 to April 30. OSHA forms can now be maintained on the computer until they are needed.

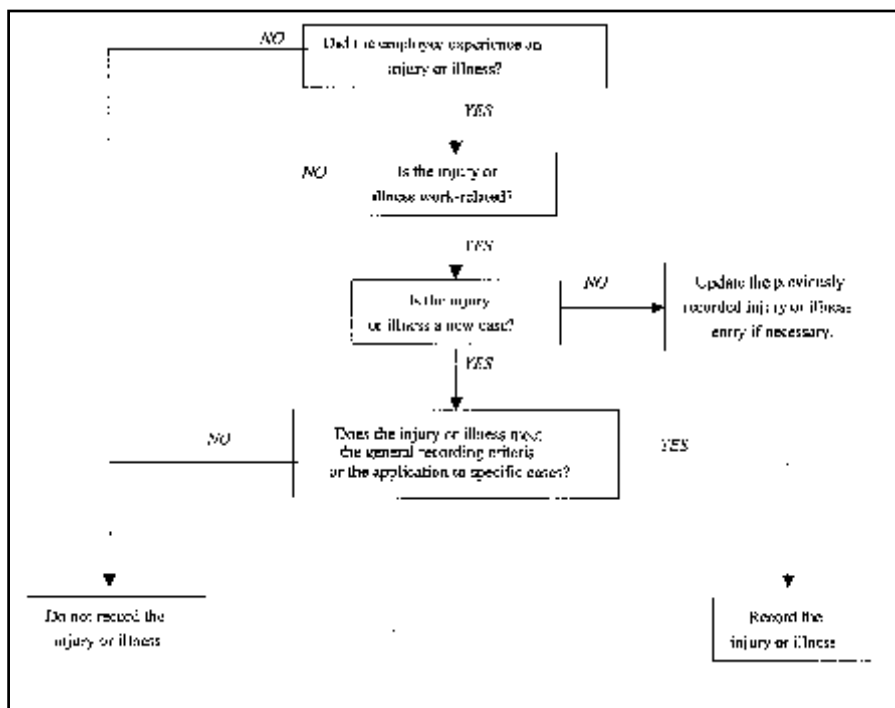


Figure 6-3. Determining recordability of injuries and illnesses. (Courtesy of the Occupational Safety and Health Administration.)

All employers with no more than 10 full- or part-time employees at any one time in the previous calendar year are not required to follow the recordkeeping requirements. Employers in finance, insurance, real estate, and services industries are usually not required to keep records.

Some employers and individuals who never keep OSHA records are:

- Self-employed individuals.
- Partners with no employees.
- Employers of domestics.
- Employers engaged in religious activities.

MEDICAL AND EXPOSURE RECORDS

Medical examinations are required by OSHA regulations for workers before they can perform certain types of work. This work includes at the present:

- Asbestos abatement.
- Lead abatement.
- Hazardous waste remediation.
- When workers are required to wear respirators for 30 days during a year.

Exposure records (monitoring records) are to be maintained by the employer for 30 years. These records include personal sampling, air sampling, and other industrial hygiene sampling records. Medical records are to be maintained by the employer for the length of employment plus 30 years.

In order to access copies of medical records, a worker must make a written request to obtain a copy of the medical records or to make them available to his or her representative or physician (see 29 CFR 1910.1020). A worker's medical record is considered confidential and a request, in writing, from the worker to the physician, is required for the records to be released.

If an employer goes out of business or sells the business, the medical records of employees can be transferred to the new owner or if no successor exists then the previous employer is to contact the affected workers to make their records available to them prior to disposal. Also, the previous employer must notify the Director of NIOSH three months in advance to determine if NIOSH will accept the records. If NIOSH does not respond then the previous employer may dispose of the medical records.

POSTING

Employers are required to post in a prominent location the following:

- Job Safety and Health Protection workplace poster (OSHA Form 2203) or state equivalent.
- Copies of any OSHA citations of violations of the OSHA standard are to be posted at or near the location of the violation for at least three days or until the violation is abated, whichever is longer.
- Copies of summaries of petitions for variances from any standard, including record-keeping procedures.
- The summary portion of the "Log and Summary of Occupational Injuries and Illnesses" (OSHA 300A Summary) is to be posted annually from February 1 to April 30.

MULTI-EMPLOYER WORKSITES

On multi-employer worksites, citations are normally issued to the employer whose employees are exposed to workplace hazards (the exposing employer). The following interpretation would be especially germane to office buildings. In addition, the following employers normally shall be cited, whether or not their own employees are exposed:

- The employer who actually creates the hazard (the creating employer).
- The employer who is responsible, by contract or through actual practice, for safety and health conditions on the worksite, i.e., the employer who has the authority for ensuring that the hazardous condition is corrected (the controlling employer).

- The employer who has the responsibility for actually correcting the hazard (the correcting employer).

Prior to issuing citations to an exposing employer, it must first be determined whether the available facts indicate the employer has a legitimate defense to the citation. This is accomplished by answering the following questions:

- Did the employer create the hazard?
- Did the employer have the responsibility or authority to have the hazard corrected?
- Did the employer have the ability to correct or remove the hazard?
- Did the employer demonstrate that the creating, the controlling or the correcting employers, as appropriate, have been specifically notified of the hazard to which their employees are exposed?
- Did the employer instruct employees to recognize the hazard?

Where feasible, an exposing employer must have taken appropriate, alternative means of protecting employees from the hazard, and when extreme circumstances justify it, to avoid a citation the exposing employer shall remove employees from the job. If an exposing employer has met all of the previous criteria, then the employer shall not be cited.

If all employers on a worksite who have employees exposed to a hazard meet the previous criteria, the citation shall be issued only to the employers who are responsible for creating the hazard or are in the best position to correct or ensure correction of the hazard. In such circumstances, the controlling employer and/or the hazard-creating employer shall be cited even though none of their employees are exposed to the condition that resulted in the violation. Penalties for such citations shall be appropriately calculated by using the exposed employees of all employers as the number of employees for probability assessment.

SUMMARY

It is envisioned that this chapter will be an asset to employers. It will give you a brief overview of what you can expect from OSHA. Previous experiences have been shown to fix accountability, as well as responsibility, upon those who claim ignorance of it. The workplace is where both workers and management spend the bulk of their waking hours. With this in mind, the safety and health of those in the workplace should be everyone's concern and responsibility.

Employers and safety and health professionals need to know how OSHA provides for worker safety and health on worksites. This will also assist in assuring that the workers' rights are protected and give them the knowledge to help mitigate health and safety issues and problems that may arise. This type of knowledge should ensure a safer and more productive worksite. Respect for the efficient, effective and proper use of the health and safety rules will have a positive effect upon those in the workplace.

Although it is the ultimate responsibility of the employer to provide for workplace safety and health, the adherence to OSHA occupational safety and health rules are the foundation upon which a good safety and health program can be built.

The program should hold everyone responsible for the well-being of those in the workplace, including the employer, managers, supervisors, and workers. All should abide by the safety and health rules and the OSHA standards. Together, and through cooperation, all parties can assure a safe and healthy workplace. A safe and healthy home away from home is and should be the ultimate goal.

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CHAPTER 7

OFFICE BUILDING SAFETY



Is this a hazardous office situation? Of course there are many hazards in this particular situation.

Safety in an office setting has often been viewed as not essential since there are no hazards. This view is definitely not accurate. There are many hazards and, although few occupational deaths, injuries are an issue faced by the owner or employers. Injuries cost money in the form of real dollars for medical costs, workers' compensation, increased insurance premiums, repair of equipment, temporary help, and potential legal actions. If you have not considered and identified the potential hazards in your office building, you have been remiss. In this chapter the identified office hazards will be discussed and suggestions on control and mitigation are set forth.

IDENTIFYING HAZARDS

As with any type of accident prevention program, office safety first requires that we recognize the hazards that exist. The types of hazards will depend upon the potential types of accidents that can transpire. To start, first consider whether any of the following standard types of accident could occur in your office setting.

To make this task manageable you should work with basic types of accidents. The question to ask yourself is, “Can any of these accident types or hazards inflict injury to a worker?” There are eleven basic types of accidents:

- Struck-against
- Struck-by
- Contact-with
- Contacted-by
- Caught-in
- Caught-on
- Caught-between
- Fall-same-level
- Fall-to-below
- Overexertion
- Exposure

You should look at each of these basic accident types to identify procedures, processes, occupations and tasks that present a hazard to cause one of the accident types in the preceding list of types.

ACCIDENT TYPES

Struck-Against Type of Accidents

Look at these first four basic accident types—struck-against, struck-by, contact-with and contacted-by—in more detail, with the job step walk-around inspection in mind. Can the worker strike against anything while doing the job step? Think of the worker moving and contacting something forcefully and unexpectedly—an object capable of causing injury. Can he or she forcefully contact anything that will cause injury? This forceful contact may be with machinery, timber or bolts, protruding objects or sharp, jagged edges. Identify not only what the worker can strike against, but how the contact can come about. This does not mean that every object around the worker must be listed.

Struck-By Type of Accidents

Can the worker be struck by anything while doing the job step? The phrase “struck by” means that something moves and strikes the worker abruptly with force. Study the work environment for what is moving in the vicinity of the worker, what is about to move, or what will move as a result of what the worker does. Is unexpected

movement possible from normally stationary objects? Examples are ladders, tools, containers, supplies, and so on.

Contact-By and Contact-With Types of Accidents

The subtle difference between contact-with and contact-by injuries is that in the first, the agent moves to the victim, while in the second, the victim moves to the agent. Can the worker be contacted by anything while doing the job step? The contacted-by accident is one in which the worker could be contacted by some object or agent. This object or agent is capable of injuring by non-forceful contact. Examples of items capable of causing injury are chemicals, hot solutions, fire, electrical flashes, and steam.

Can the worker come in contact with some agent that will injure without forceful contact? Any type of work that involves materials or equipment, which may be harmful without forceful contact, is a source of contact-with accidents. There are two kinds of work situation that account for most of the contact-with accidents. One situation is working on or near electrically charged equipment, and the other is working with chemicals or handling chemical containers.

Caught-In and Caught-On Types of Accidents

The next three accident types involve “caught” accidents. Can the person be caught in, caught on, or caught between objects? A caught-in accident is one in which the person, or some part of his or her body, is caught in an enclosure or opening of some kind. Can the worker be caught-on anything while doing the job step? Most caught-on accidents involve a worker’s clothing being caught on some projection of a moving object. This moving object pulls the worker into an injury contact. Or, the worker may be caught on a stationary protruding object, causing a fall.

Caught-Between Type of Accidents

Can the worker be caught between any objects while doing the job step? Caught-between accidents involve having a part of the body caught between something moving and something stationary, or between two moving objects. Always look for pinch points.

Fall: Same Level and Fall-to-Below Types of Accidents

Slip, trip, and fall accident types are one of the most common accidents occurring in the workplace. Can the worker fall while doing a job step? Falls are such frequent accidents that we need to look thoroughly for slip, trip, and fall hazards. Consider whether the worker can fall from something above ground level, or whether the worker can fall to the same level. Two hazards account for most fall-to-same level accidents: slipping hazards and tripping hazards. The fall-to-below accidents occur in situations where employees work above ground or above floor level, and the results are usually more severe.

Overexertion and Exposure Types of Accidents

The next two accident types are overexertion and exposure. Can the worker

be injured by overexertion; that is can he or she be injured while lifting, pulling, or pushing? Can awkward body positioning while doing a job step cause a sprain or strain? Can the repetitive nature of a task cause injury to the body? An example of this is excessive flexing of the wrist, which can cause carpal tunnel syndrome (which is abnormal pressure on the tendons and nerves in the wrist).

Finally, can exposure to the work environment cause injury to the worker? Environmental conditions such as noise, extreme temperatures, poor air, toxic gases and chemicals, or harmful fumes from work operations should also be listed as hazards and will be discussed in other chapters.

OFFICE HAZARDS

Once the process of hazard identification starts to take place, you probably realized that many hazards exist in the office workplace. These hazards include lifting, material handling, trips, falls, electrical, and a few others. We could expect such injuries as sprains, strains, cuts, bruises, lacerations, eye injuries, and burns, to name a few.

OFFICE-RELATED INJURIES

Changes have occurred in the American workplace as a result of the new office technology and automation of office equipment. As with all new technology, these changes bring with it a set of health and safety concerns. In addition to obvious hazards such as slippery floors or an open file drawer, a modern office may also contain hazards such as poor lighting, noise, poorly designed furniture, and equipment and machines that emit gases and vapors when improperly maintained. Even the nature of office work itself has produced a whole host of stress-related symptoms and musculoskeletal strains. For example, long hours at a poorly designed computer workstation can cause pains in the neck and back, shoulders, lower extremities, arms, wrists, hands, eyestrain, and a general feeling of tension and irritability. The leading types of disabling accidents that occur within the office are the result of falls, strains and overexertions, falling objects, striking against objects, and being caught in or between objects.

Falls

Falls are the most common office accident, accounting for the greatest number of disabling injuries. The disabling injury rate of falls among office workers is 2 to 2.5 times higher than the rate for non-office employees. A fall occurs when you lose your balance and footing. One of the most common causes of office falls is tripping over an open desk or file drawer. Bending while seated in an unstable chair and tripping over electrical cords or wires are other common hazards. Office falls are frequently caused by using a chair or stack of boxes in place of a ladder and by slipping on wet floors. Loose carpeting, objects stored in halls or walkways, and inadequate lighting are other hazards that invite accidental falls. Fortunately, all of these fall hazards are preventable. The following checklist can help stop a fall before it happens.

- Be sure the pathway is clear before you walk.

- Close drawers completely after every use.
- Avoid excessive bending, twisting, and leaning backward while seated.
- Secure electrical cords and wires away from walkways.
- Always use a stepladder for overhead reaching. Chairs should never be used as ladders.
- Clean up spills immediately.
- Pick up objects co-workers may have left on the floor.
- Report loose carpeting or damaged flooring.
- Never carry anything that obscures your vision.
- Wear stable shoes with non-slip soles.

Stairways are the cause of many falls. It is imperative that all stairways be kept clear of any debris or materials of any kind. Stairways should not be worn in such a way that a worker could catch a toe or slip on them. Coverings on any stairs should be maintained in good repair with no cracks, broken or missing portions, and no tears in carpet that covers them. Handrails should be in place and securely fastened so that they can support workers traveling up and down them.

If you find yourself heading for a fall, remember to roll, don't reach. By letting your body crumple and roll, you are more likely to absorb the impact and momentum of a fall without injury. Reaching an arm or leg out to break your fall may result in a broken limb instead.

Struck-By or Striking-Against Objects

Striking against objects is another cause of office injuries. Incidents of this type include:

- Bumping into doors, desks, file cabinets, and open drawers.
- Bumping into other people while walking.
- Striking open file drawers while bending down or straightening up.
- Striking against sharp objects such as office machines, spindle files, staples, and pins.

Pay attention to where you are walking at all times, properly store materials in your work area, and never carry objects that prevent you from seeing ahead of you. Objects striking employees occur as a result of:

- Office supplies sliding from shelves or cabinet tops.
- Overbalanced file cabinets in which two or more drawers were opened at the same time or in which the file drawer was pulled out too far (see Figure 7-1).
- Machines, such as FAX machines, that were dropped on feet.
- Doors that were opened suddenly from the other side.

Proper material storage and use of storage devices can avoid these accidents.



Figure 7-1. Any of these file cabinets could tilt onto a worker. Open file draws one at a time and close prior to opening another drawer.

Caught In or Between Objects

The last category of leading disabling incidents occurs as a result of office workers who get their fingers or articles of clothing caught in or between objects. Office workers may be injured as a result of:

- Fingers caught in a drawer, door, or window.
- Fingers, hair or articles of clothing and jewelry caught in office machines.
- Fingers caught under the knife-edge of a paper cutter.

While working on office equipment, concentrate on what you are doing.

Material Handling

Material handling poses more than one hazard. Handling that requires lifting and moving can result in overexertion injuries. These are primarily injuries to the back, arms, and shoulders. These injuries occur because:

- Workers use improper lifting techniques.
- The load to be lifted is too heavy or awkward.
- The placement of the load to be lifted is poorly placed.
- Materials have been improperly stored or stacked.

Electrical Safety

Electricity is essential to the operations of a modern automated office as a source of power. Electrical equipment used in an office is potentially hazardous and can cause serious shock and burn injuries if improperly used or maintained.

Electricity travels through electrical conductors that may be in the form of wires or parts of the human body. Most metals and moist skin offer very little resistance to the flow of electrical current and can easily conduct electricity. Other substances such as dry wood, porcelain, or pottery offer high resistance and can be used to prevent the flow of electrical current. If a part of the body comes in contact with the electrical circuit, a shock will occur. The electrical current will enter the body at one point and leave at another. The passage of electricity through the body can cause great pain, burns, destruction of tissue, nerves, and muscles, and even death. Factors influencing the effects of electrical shock include the type of current, voltage, resistance, amperage, pathway through the body and the duration of contact. The longer the current flows through the body, the more serious the injury. Injuries are less severe when the current does not pass through or near nerve centers and vital organs. Electrical accidents usually occur as a result of faulty or defective equipment, unsafe installation, or misuse of equipment on the part of the office worker.

Electrical hazards, for example, are often easy to spot if one stays alert. Extension cords can be a major problem because they can lead to overloaded outlets. If an extension cord must be used, be sure that it's powerful enough to handle the equipment that it is plugged into. Also, be sure that it is in good shape and does not run under a rug or through high traffic areas (*note*: an extension cord dissipates heat, but when covered with a rug or other object the heat that builds up can result in a fire). Some general electrical safety reminders include:

- Avoid overloading outlets
- Always match plugs and outlets, making sure never to force a three-prong plug into a two-prong outlet.
- Check for worn or frayed cords and have them replaced immediately.
- Never place cords near heat or water (see Figure 7-2).



Figure 7-2. Electric cords wedged against a heating unit.

- Never use electrical equipment when your hands or the equipment are wet.
- Report any potential electrical problems.

Many types of electrical hazards can be found in an office environment including the following:

Ungrounded Equipment

Grounding is a method of protecting employees from electrical shock. By grounding an electrical system, a low-resistance path to earth through a ground connection is intentionally created. When properly done, this path offers sufficiently low resistance and has sufficient current-carrying capacity to prevent the build-up of hazardous voltages. Most fixed equipment, such as large, stationary machines, must be grounded. Cord- and plug-connected equipment must be grounded if it is located in a hazardous or wet location, if operated at more than 150 volts to ground, or if it is of a certain type of equipment (such as refrigerators or air conditioners). Smaller office equipment, such as typewriters and coffee pots, would not generally fall into these categories and therefore do not have to be grounded. However, much of the newer office equipment is manufactured with grounded plugs as a precaution (three-pronged plugs). In such cases, never remove the third (grounding) prong from the plug.

Overloaded Outlets

Insufficient or overloaded electrical outlets should be avoided. A sufficient number of outlets will eliminate the need for extension cords. Overloading electrical circuits and extension cords can result in a fire. Floor-mounted outlets should be carefully placed to prevent tripping hazards.

Unsafe/Non-Approved Equipment

Poorly maintained or unsafe, poor quality, non-approved (Underwriters Laboratory) coffee makers, radios, lamps, etc. (often provided by or used by employees) should be discarded. Such appliances can develop electrical shorts creating fire and/or shock hazard. Equipment and cords should be inspected regularly; a qualified individual should make repairs.

Defective, Frayed or Improperly Installed Cords for Electrically Operated Office Equipment

When the outer jacket of a cord is damaged, the cord may no longer be water-resistant. The insulation can absorb moisture, which may then result in a short circuit or excessive leakage to ground. If wires are exposed, they may cause a shock to a worker who contacts them. These cords should be replaced. Electrical cords should be examined on a routine basis for fraying and exposed wiring.

Improper Placement of Cords

A cord should not be pulled or dragged over nails, hooks, or other sharp objects that may cause cuts in the insulation. In addition, cords should never be placed on radiators, steam pipes, walls, and windows. Particular attention should be placed on connections behind furniture, since files and bookcases may be pushed tightly against electrical outlets, severely bending the cord at the plug.

Electrical Cords Across Walkways and Work Areas

An adequate number of outlet sockets should be provided. Extension cords should be used only in situations where fixed wiring is not feasible. However, if it is necessary to use an extension cord, never run it across walkways or aisles due to the

potential tripping hazard. If you must run a cord across a walkway, either tape it down or purchase a cord runner.

Live Parts Unguarded

Wall receptacles should be designed and installed so that no current-carrying parts will be exposed, and outlet plates should be kept tight to eliminate the possibility of shock.

Pulling of Plugs to Shut Off Power

Switches to turn on and off equipment should be provided, either in the equipment or in the cords, so that it is not necessary to pull the plugs to shut off the power. To remove a plug from an outlet, take a firm grip on the plug and pull the plug itself. Never pull a plug out by the cord.

Working on “Live Equipment”

Disconnect electrical machines before cleaning, adjusting, clearing a jam, or applying flammable solutions. If a guard is removed to clean or repair parts, replace it before testing the equipment and returning the machine to service.

Blocking Electrical Panel Doors

If electrical malfunction should occur, the panel door and anything else in front of the door will become very hot. Electrical panel doors should always be kept closed to prevent “electrical flashover” in the event of an electrical malfunction (see Figure 7-3).

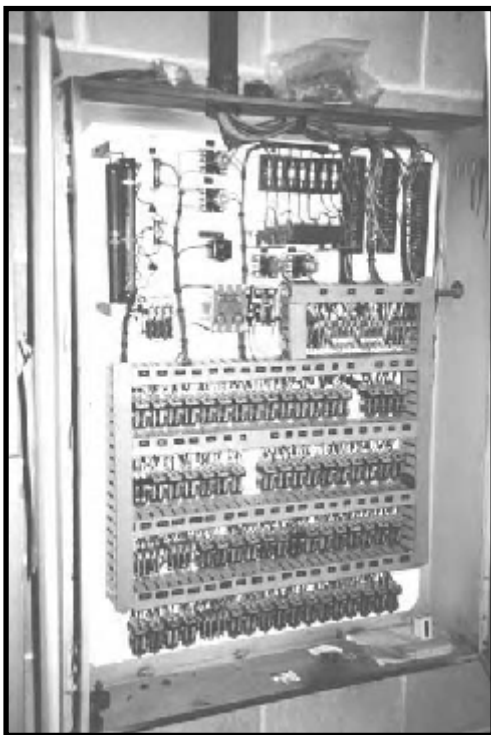


Figure 7-3. An example of an unsecured electrical panel.

Cuts by Sharp Objects

Sharp objects such as pencils, ballpoint pens, letter openers, razor blades, paper, utility knives, scissors, etc. can cause serious injury. These items must be properly placed inside drawers. When they are put inside a drawer use a penholder, and the sharp ends should not be allowed to point upwards. Pins or tacks should not be placed casually on the desk, but should be properly contained.

Preventing Cuts and Punctures

Cuts and punctures happen when people use everyday office supplies without exercising care. Follow these guidelines to help reduce the chance for cuts and punctures:

- When sealing envelopes, use a liquid dispenser, not your tongue.
- Be careful when using kitchen knives, scissors, staplers, letter openers, and box openers. Any of these items could cause a painful injury.
- Avoid picking up broken glass with your bare hands. Wear gloves and use a broom and a dust pan.
- Place used blades or broken glass in a rigid container, such as a box, before disposing in a wastebasket.

Burns and Scalds

This kind of injury can happen when handling hot drinks and hot food, especially in the lunchroom. The temperature of certain parts of some office equipment and machines (e.g., printer head, some part of the photocopy machines, etc.) is high enough to cause burns. Care should be taken to:

- Ensure that the pots/pans and stoves in the lunchroom are of appropriate size and type so that there is no risk for the pan or pots to tip over. Make sure pans/pots are placed on the stoves properly.
- All heating surfaces (stoves) and pans/pots should be regarded as hot if uncertain. Pans/pots holding hot substances must be placed in public areas.
- Avoid congestion in the lunch areas.
- Improper use of microwave ovens may also cause burns and scald injuries. Never heat food inside airtight containers. The manufacturer's operating instructions must be strictly followed.
- Never put hot drinks in places where they can be easily knocked over. Sufficient warnings should be given to other persons who are nearby when hot substances are being moved or handled.
- Never touch any hot machine parts, which are usually labeled in yellow.

Elevator and Escalator Safety

Elevators, escalators and moving walks are one of the safest forms of transportation. Each year in the United States and Canada this equipment moves the equiva-

lent of double the entire U.S. and Canadian population—over 210 billion passengers each year. Very few accidents happen and most of these can be avoided.

Elevators

In multi-floor office buildings the use of elevators is commonplace. The use of elevators should be accomplished by following some very basic rules to assure rider safety. These rules are:

- When you approach the elevator:
 - Know your destination. Push the elevator call button for the direction that you want to go.
 - Stand aside for exiting passengers.
 - Wait for the next car, if the elevator is full.
 - Take the stairs if there is a fire (see Figure 7-4).
 - Don't try to stop a closing door. Wait for the next elevator.



Figure 7-4. Warning signage at elevator entrance area.

- When you enter and leave the elevator:
 - Enter and exit carefully. Step up or down if the elevator floor and hall floor are not level.
 - Stand clear of the doors (keep clothes and carry-on items away from the opening).
 - Push and hold the door-open button if doors need to be held open, or ask someone to push the button for you.

- When riding on the elevator
 - Stand next to the elevator wall.
 - Hold the handrail, if available.
 - Pay attention to the floor indications.
 - If the doors do not open when the elevator stops, push the door-open button.
- General rules:
 - Watch your step.
 - Leave closing doors alone.
 - If doors don't open, ring alarm button and wait.
 - If there is a fire in the building, use stairs.

Escalators

Unlike an elevator where the passenger-carrying compartment is fully enclosed, escalators and moving walks are only partially enclosed. The moving passenger is always adjacent to surfaces that are not moving or possibly not moving. Precaution similar to those around any moving machinery should be observed. Some of the safety precautions and practices are as follows:

- When entering escalators:
 - Watch the direction of the moving steps.
 - Step on and off with extra care. Take care if you wear bifocals.
 - Grasp the handrail as you step promptly onto the moving step.
 - Keep loose clothing clear of steps and sides.
- When riding escalators:
 - Keep to the right and face forward.
 - Keep a firm grip on the handrail.
 - Reposition your hand slowly if the handrail moves ahead or behind the steps.
 - Don't rest handbags or parcels on the handrail.
 - Don't window shop while riding.
 - Don't lean against the sides.
- When exiting escalators:
 - Don't hesitate.
 - Step off promptly.
 - Immediately move clear of the escalator exit area. Do not talk or look around since other passengers are behind you.
- General rules:
 - Step on and off carefully.
 - People only (no other rolling devices).

- Hold handrail.
- Do not touch sides below the handrail.
- Stand facing forward.

File Cabinets and Shelves

Because file cabinets and shelves tend to support heavy loads, treat them with special care. Follow these safety guidelines for file cabinets:

- Secure file cabinets that are not weighted at the bottom. Either bolt them to the floor or to the wall.
- Ensure that file cabinet drawers cannot easily be pulled clear of the cabinet.
- Do not block ventilation grates with file cabinets.
- Open only one drawer at a time to keep the cabinet from toppling.
- Close drawers when they are not in use.
- Do not place heavy objects on top of cabinets. Be aware that anything on top of a cabinet may fall off if a drawer is opened suddenly (see Figure 7-5).



Figure 7-5. File cabinets with the hazard from the fall or shift of materials on top of them.

- Close drawers slowly, using the handle to avoid pinched fingers.
- Keep the bottom drawer full. This will help stabilize the entire cabinet.

In addition, follow these safety guidelines for office shelves:

- Secure shelves by bolting them to the floor or wall.
- Place heavy objects on the bottom shelves. This will keep the entire structure more stable.
- Ensure that there are at least 18 inches between the top shelf items and the ceiling. This space will allow ceiling sprinklers (if present) to function properly if a fire occurs.
- Do not block ventilation grates with shelves.
- Never climb on shelves (even lower shelves). Use an approved ladder.

Desks

Follow these safety guidelines for office desks:

- Keep desks in good condition (i.e., free from sharp edges, nails, etc.).
- Ensure that desks do not block exits or passageways.
- Ensure that glass-top desks do not have sharp edges.
- Ensure that desks with spring-loaded tables function properly. The table should not spring forth with enough force to cause an injury.
- Do not climb on desks. Use an approved ladder.
- Keep desk drawers closed when not in use.
- Repair or report any desk damage that could be hazardous.

Chairs

Safety guidelines for office chairs include the following:

- Do not lean back in office chairs, particularly swivel chairs with rollers.
- Do not climb on any office chair. Use an approved ladder.
- Office desk chairs should have adjustable back supports and seat height. Make sure that your chair's back support position and seat height are comfortable.
- Take care when sitting in a chair with rollers. Make sure it does not roll out from under you when you sit down. Repair or report any chair damage that could be hazardous.
- Do not roll chairs over electrical cords.

Ladders

Always use an approved ladder or stool to reach any item above your extended arm height. Never use a makeshift device, such as a desktop, file cabinet, bookshelf, or box, as a substitute for a ladder. Follow these guidelines when using ladders:

- Do not load a ladder above its intended weight capacity (see Figure 7-6).
- Place ladders on slip-free surfaces even if they have slip-resistant feet. Secure the ladder if a slip-free surface is not available.
- Avoid placing ladders in walkways. Secure a ladder if its location could cause an accident.
- Keep areas around ladders clean and free of debris.
- Do not use a ladder in front of a door unless the door is locked and barricaded.

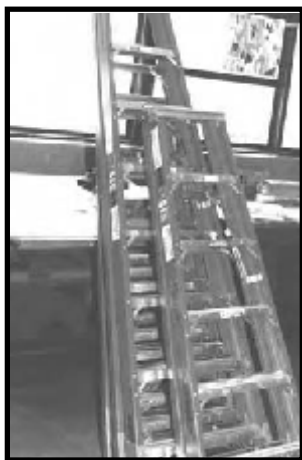


Figure 7-6. Choose the right ladder for the job. Having more than one size helps prevent misuse of ladders.

SAFETY IN THE OFFICE

Accidents do happen in the office. Few office workers realize that they are twice as likely to be injured in a fall as a non-office workers. Nationally, only automobile accidents outnumber falls as the leading cause of all accidents. In the office, slips, trips and falls are the number one cause of disabling injuries.

Thinking and working safely can prevent most accidents. Workers can become more aware of the most common hazards in the office environment. The following are some examples of common hazards and what can be done to prevent them from becoming accidents:

- Don't lean back in a chair. Keep all legs on the floor so that you do not end up on the floor. Take time to reach out and hold on to the chair as you sit down. Be sure that the chair is beneath you as you sit.
- Keep the floor and walkway clear of electrical, telephone, and computer cables, boxes, etc. They are tripping hazards waiting to happen.
- Close one drawer of a filing cabinet before opening another. This prevents the file cabinet from tipping over on you.

- Close the drawer in your desk before getting up, and close file drawers before walking away from the file cabinet. This prevents the danger of other workers walking into an open file drawer or desk drawer.
- Store supplies inside cabinets, not on top of them. Store heavy items in lower drawers or on lower shelves.
- Watch out for slippery surfaces. Spilled drinks or water from umbrellas are typical hazards and need to be cleaned up/or identified immediately.
- Look where you are going. Don't block your view by carrying loads higher than eye level.
- Don't read while walking. It doesn't save enough time to justify the risk.
- Walk, do not run. Take your time.
- Don't climb on chairs, desks, or boxes. Use a stepladder instead.
- Hold onto handrails when using stairways.
- Use elevators, if they are available, when carrying boxes.
- Don't throw matches, ashes or cigarette butts into wastebaskets. If the building has been designated as a smoke-free building—do not smoke in the building.
- Don't overload wall sockets and extension cords.
- Don't touch electrical switches, sockets, plugs, etc. with wet hands.
- Don't eat or drink at a computer station. It could result in a malfunction of the computer and void the warranty.
- Watch for unsafe conditions such as defective equipment, burned out lights, loose steps, torn carpet, etc. and report them to your supervisor immediately (see Figure 7-7, The Office Safety Do's and Don't Checklist).

OFFICE SAFETY DO's AND DON'Ts CHECKLIST

DO:

- ☐ Report slippery and uneven floor surfaces, torn carpet, or linoleum to your supervisor or to facility maintenance.
- ☐ Keep file and desk drawers closed when not in use.
- ☐ Stack cartons and supplies carefully so they won't fall.
- ☐ Be sure file cabinets aren't top heavy.
- ☐ Place all desk materials within easy reach.
- ☐ Replace electrical cords when insulation frays.
- ☐ Report problems with poor ventilation or odors to your supervisor.
- ☐ Report problems with lighting.
- ☐ Make sure electrical plugs match their outlets.
- ☐ Put desk material and papers away when not in use.

- ☐ Know where fire extinguishers and first aid kits are kept.
- ☐ Check that fire extinguishers are inspected regularly and fully charged.
- ☐ Check container label and Material Safety Data Sheets (MSDS) before using chemicals.
- ☐ Immediately clean up spills, no matter how small or large.
- ☐ Be careful with utility knives, razor blades, scissors and other sharp objects.
- ☐ Know what to do in case of an emergency—call 911 immediately!
- ☐ Use dollies, hand trucks, or similar equipment to move large and heavy items.
- ☐ Use proper lifting techniques that let the legs, not the back, do the work.
- ☐ Take occasional stretch breaks.
- ☐ Use a ladder or step stool rather than standing on furniture to reach high places.
- ☐ Adjust the position and height of your computer monitor, chair, keyboard, and mouse to avoid strains and fatigue.
- ☐ Smoke only in designated areas.

DON'T

- ☐ Leave boxes and other materials in aisles, corridors, or stairways.
- ☐ Block emergency exits or access to fire extinguishers.
- ☐ Use extension cords unless authorized.
- ☐ Overload electrical outlets.
- ☐ Leave combustible trash in open containers.
- ☐ Carry loads that block your vision.
- ☐ Run in aisles, halls, or on stairways.
- ☐ Throw objects or engage in horseplay.
- ☐ Overload cabinets or shelves.
- ☐ Forget to turn off electrical appliances and coffee pots at night.
- ☐ Lift objects manually that are too heavy or awkward.
- ☐ Store razor blades or other sharp objects loose in a drawer.
- ☐ Lean on your wrist on the edge of your desk or computer stand for prolonged periods of time. Use a wrist rest if necessary.
- ☐ Attempt to repair office equipment if not properly trained.
- ☐ Tape or block air vents.
- ☐ Twist your body when lifting objects.
- ☐ Cradle the phone receiver between your head and shoulder.
- ☐ Use personal cleaning solutions or pesticides.
- ☐ Stand on chairs or boxes to reach objects or high places.
- ☐ Leave file drawers open.
- ☐ Smoke in unauthorized areas.

Figure 7-7. Office safety do's and don'ts checklist.

SUMMARY

It can be easily seen from the previous pages that even though the office is not considered hazardous work. It still contains a number of hazards, which have the potential to inflict serious injury if tacitly overlooked. The office workers should be trained to identify and remove or report suspected hazards. A comprehensive audit/inspection checklist can be found in Appendix D to use or revise to meet your office

inspection needs. When the workforce takes a devil may care attitude regarding existing hazards, they are exposing themselves to the harmful effects of these hazards. Hazards, even in an office work environment must be identified and controlled or removed just as any other hazard in any other industry would be handled.

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CHAPTER 8

OFFICE EQUIPMENT SAFETY



Typical office equipment.

Office equipment can be as simple as a pencil or as complex as a laser printer. Each piece of office equipment can present its own unique hazards. Thus, understanding the potential hazards and ways to prevent any serious harm from them is the purpose in this chapter.

NON-POWERED EQUIPMENT

Some forms of office equipment are not operated by electricity. These types of equipment usually create hazards related to cuts, pinches, punctures, or crushing injuries. These pieces of equipment are staplers, scissors, paper cutters, hole punches, letter openers, utility knives, and tape dispensers. Seldom is much attention paid to these pieces of office equipment since most workers view them as just tools of the

trade, so to speak. Even these tools of the trade can cause serious injuries if misused (see Figure 8-1).



Figure 8-1. Non-powered office equipment.

Even though many office workers seldom consider non-powered tools as being hazardous, reminders should be given during the initial training and if a near-miss or incident (injury) has occurred. Even though these injuries may be something as simple as a cut, it should receive first aid and be reported to the supervisor. Injuries that are considered incidental can become infected and then become much more serious and more expensive. No injury should be taken lightly. This is why it is a good idea to investigate all injuries even if they are first aid related. You might want to maintain a first aid log. An example of a first aid log can be found in Chapter 18.

POWERED EQUIPMENT

Powered equipment is usually operated by electricity, and since most modern offices are very automated seldom does any desk not have a computer on it. Our vision of office equipment is usually the computer on the desk. But, there are many types of powered office equipment. Some examples can be found in Figure 8-2.

Hazards from Powered Office Equipment

Powered office equipment can release energy almost instantaneously. This may be mechanical energy, which can cause punctures, crushing, or cuts. Also they may release heat energy that can cause burns. With some office equipment chemical exposures are possible from toner and print cartridge contact or emission. Besides chemical energy there is electrical energy which may be the most common hazard with office equipment. The release of electrical energy may cause shocks and burns with the possibility of electrocution very real. Some general rules regarding powered office equipment are as follows:

POWERED EQUIPMENT (OFFICE)	
Binders	Laminators
Automated files	Shrink wrap equipment
Pencil sharpeners	Slot punches
Die cutters	Automatic staplers
Paper cutters	Printers
Hole punches	Video display terminals
Paper drills	Computers
Paper folders	Photocopiers
Shredders	Overhead projectors
Money counters	Slide projector
Check writing and signing machines	VCRs
Collators	TVs
Paper jogger and counters	Typewriters
Stamping machines	

Figure 8-2. Examples of powered office equipment.

- Keep hands away from the point of operation of any equipment.
- Jewelry is a good conductor of electricity, especially rings and bracelets that could most easily contact energized electrical devices. Stay away from exposed electrical equipment. (*Note:* most office equipment is encased to prevent worker contact.)
- No worker should work on electrical equipment unless he or she has been trained.
- Do not attempt to remove a jam unless you unplug the electrical cord on the piece of equipment.
- There is no guarantee that unplugging equipment will fully deenergize it. Some types of electrical equipment can hold an electrical charge.
- Loose clothing, jewelry, and long hair can be easily caught in power office equipment.
- Lifting and carrying office equipment can cause back injuries and sharp edges could cut your hands and fingers.
- Repairs should be done by qualified service technicians.
- Before operating or adjusting any office equipment you should be trained, follow manufacturer’s instructions and pay attention to all warning labels (see Figure 8-3).

COMPUTER HAZARDS

The most prevalent piece of office equipment in today’s offices is the computer and its auxiliary components. Most of the casing encloses and keeps the potential for electrical shock away from workers. Usually most of the computer equipment



Figure 8-3. Powered office equipment is everywhere in the office environments.

is not a heat hazard to workers. Since they are run by electricity, if you see sparks, smell an acrid odor, or notice heat coming from the computer, pulling the plug if possible would be the best option rather than just turning it off. This action may help prevent a possible fire from occurring. Another hazard that exists is from the video display terminal (monitor). Most monitors have a cathode ray tube (CRT) in them except for the newest of models such as flat screens. These CRTs have the potential to retain an electrical charge and thus pose a shock or electrocution hazard. The CRTs can implode which will eject glass shards with a good amount of force. For these reasons it is advised against workers trying to perform any service on any of the components of the computer.

PHOTOCOPIERS

Photocopiers and laser printers are safe when used occasionally and serviced regularly. But, if they are badly positioned, poorly maintained, and used frequently for long runs, there are risks to health, ranging from irritated eyes, nose, and throat to dermatitis, headaches, premature aging and reproductive and cancer hazards. In order to assure that a photocopier is functioning in an effective manner, close attention needs to be paid to:

- Location—to allow adequate ventilation and to minimize noise; see Figure 8-4.
- Maintenance—poor maintenance can increase the emission of toxic chemicals.
- Usage—large print runs will exacerbate the previous factors.



Figure 8-4. A photocopying machine in an adequately ventilated location.

Some of the safety factors with photocopiers are as follows:

- Ultraviolet light (UV)—The photocopier lid should be kept fully depressed when the machine is operating. UV light can cause eye irritation and burns.
- Noise levels—Can reach 65 dB(A) for ordinary copiers. Copiers with noisy collators should be positioned as far from workers as possible.
- Fire potential—Excessive dust in electrical equipment will cause sparking. You should have a carbon dioxide fire extinguisher near the copier.
- Jams—Even though the majority of copiers cut out when opened, they should be switched off before attempting to extract jammed paper. Avoid contact with surfaces that can be very hot and remember to wash hands immediately after paper removal.
- Laser printers—Unlike photocopiers they are usually placed on desktops beside workers. However, they produce ozone like conventional copiers. There must be regular inspection of the filters which may need replacing as often as once a month. However, tests on the effectiveness of filters under factory conditions do not reflect the deterioration in performance under heavy use in the workplace.

Most of the emissions from copiers are from ozone and other chemicals that could exceed the OSHA permissible exposure limits (PEL) when the room where the photocopier is situated is too small, ventilated poorly, or usage is too high.

The chemicals that can affect health when emitted by photocopiers are as follows:

- Ozone—This gas is produced during the high voltage electrical discharge in photocopiers. It is sweet smelling and highly toxic with a PEL of 0.1

ppm. If you can smell ozone the levels are too high. Health effects are eye, nose, throat, and lung irritation, dermatitis, headaches and nausea, premature aging, and reproductive issues.

- **Toners**—Toners are generally a mixture of plastic resin and carbon black along with other additives. Carbon black is classified as a nuisance dust (e.g., is only mildly toxic) but will contain impurities known to be carcinogenic. Toner should be handled with care, protective gloves should be worn, and dust release minimized. Contact with the toner (e.g., by touching copied papers with a wet finger and transferring toner to the mouth) can lead to small growths on the tongue. Other health effects may be irritated eyes, headache and itching skin. Maintenance workers are at risk from repeated exposure that lead to skin and eye sensitization.
- **Volatile organic compounds (VOCs)**—VOCs are also emitted during photocopying. These can contain traces of decane (carcinogenic) 1,1,1-trichloroethane (cause skin irritation), iso-octane, toluene (causes fatigue, drowsiness, throat and eye irritation), xylene (can cause menstrual disorders and kidney failure), and benzene (carcinogenic and teratogenic).
- **Selenium and cadmium sulphide**—Some copier drums are impregnated with selenium and cadmium sulphide. The gas emitted from these materials, especially when hot, can cause throat irritation and sensitization (e.g., adverse effects to small quantities of the chemical). Short-term exposure to selenium by ingestion causes nausea, vomiting, skin rashes, rhinitis. The PEL for selenium is 0.2 mg/m³ and for cadmium 0.005 mg/m³ (carcinogenic).
- **Nitrogen dioxide**—May be produced when there is a spark in electrostatic photocopiers. Symptoms are similar to those of carbon monoxide. The PEL is ceiling value of 5 ppm.
- **Carbon Monoxide (CO)**—is produced when toner (containing carbon black) is heated in an inadequate supply of air. Some copiers can reach half the PEL in well-ventilated rooms. In poorly ventilated conditions the effect include headaches, drowsiness, faintness, and increased pulse rate. CO can cross the placenta and affect the unborn child. The PEL for CO is 50 ppm.

Some specific actions that can be taken to protect those who have to use photocopiers from harm are:

- **Investigate**—check health effects on people by carrying out a survey. Symptoms should be reported to the proper authority and medical tests taken when serious symptoms occur.
- **Control**—make sure copiers are regularly serviced and the filter replaced on a regular cycle. Servicing alone will only reduce chemical contamination for as short a period as a month if use is heavy. If the machine is old and faulty, get it replaced.
- **Siting and ventilation**—ventilation is crucial! Ensure that the area in which the machine is sited has a complete change of air every hour of the day, that the exhaust vent is kept free of obstruction, and that no one is situated next to the exhaust vent of the machine. Where possible no one

should work in the same room as a copier, and where this is not possible no one should be within 9 feet of the machine. Machines should not be sited in clusters or in rooms of total volume less than 720 cubic feet.

- Vent new laser printers and photocopiers in advance—demand specific information on filter changing and servicing. Accept only machines with clear maintenance guidelines, health and safety instructions and easy change filter systems. If vendors cannot provide this information, do not buy or accept the product. Demand the data from management and check the system is correctly installed.
- When maintaining the machine, adding toner, etc., follow guidelines such as wearing gloves. Hands and face must be washed immediately afterwards.
- Use the law—the Occupational Safety and Health Act imposes a general duty on every employer to ensure the health, safety and welfare of all employees at work. Regarding photocopiers, there is enough evidence of hazards that employers should pay close attention to the safety and health issues regarding them.

SUMMARY

Only use equipment that you know how to operate. Never attempt to operate an unfamiliar machine without reading the machine instructions or receiving directions from a qualified employee. In addition, follow these guidelines to ensure machine safety:

- Secure machines that tend to move during operation.
- Do not place machines near the edge of a table or desk.
- Ensure that machines with moving parts are guarded to prevent accidents. Do not remove these guards.
- Unplug defective machines and have them repaired immediately.
- Do not use any machine that smokes, sparks, shocks, or appears defective in any way.
- Close hand-operated paper cutters after each use and activate the guard.
- Take care when working with copy machines. If you have to open the machine for maintenance, repair, or troubleshooting, remember that some parts may be hot. Always follow the manufacturer's instructions for troubleshooting.
- Unplug paper shredders before conducting maintenance, repair, or troubleshooting.

Some items can be very dangerous when worn around machinery with moving parts. Avoid wearing the following items around machines with unguarded moving parts:

- Loose belts
- Jewelry
- Long, loose hair
- Long, loose sleeves or pants
- Scarves
- Ties

Do not assume that just because equipment is used in an office setting that it is inherently safe. This type of perception can lead to serious injuries even in your office environment.

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CHAPTER 9

OFFICE BUILDING HOUSEKEEPING



Clean and debris-free work area.

It might seem strange that a whole chapter would be spent regarding housekeeping in and around office buildings. Housekeeping is not only a safety and health issue, but it says something about your company. It speaks to others regarding the organizing skills of your operation. Housekeeping is not only a preventive technique, but it has a direct effect on your company's productivity and morale of your workforce. What message are you sending to your customer, workforce, and others who visit your company regarding the image of your company and your workforce?

An important factor in loss prevention is the development and implementation of good housekeeping practices. Maintaining proper housekeeping is easy in some occupancies, but difficult in others. The nature of the activities in an office building may make it more difficult to keep clean than others. Some processes produce more waste than others. Further, some buildings designed with limited floor

space make housekeeping more difficult. Such factors increase the likelihood of housekeeping problems.

Additionally, unsettled conditions that occur during building and process change may create housekeeping problems. The difficulty of controlling housekeeping increases when new construction, remodeling, process additions or process modification take place.

Poor housekeeping increases the potential for loss. It is also an indication of inadequate maintenance. It is not unusual to find an untidy facility is also rife with leaking pipes, missing covers, missing control handles, unpainted metal, nonfunctional gauges and temporary repairs.

There are many reasons that good housekeeping is essential in office buildings. The foremost is the safety and health of those within your people container. Poor housekeeping can lead to clogged passageways, fodder for fires, hidden damp areas, ideal places for the growth of biologicals (e.g., molds), areas ripe for infestation of insects and vermin, blocking of lighting, disruption of air movement by blocking vents, and unsanitary conditions, to name a few.

Whether an easy or a difficult task, proper housekeeping is a vital part of preventing worker injuries and illnesses, as well as preventing and controlling property losses. Proper housekeeping does not just happen. It requires the leadership and wholehearted support of management and the cooperation of employees.

MANAGING HOUSEKEEPING

Create a management system for proper housekeeping with a goal of keeping all areas and equipment clean and put it in writing. First appoint a housekeeping committee; this could be an individual or small group with authority and your support to achieve the goal. Second, establish levels of cleanliness by working with the committee. Third, inform employees of the committee's role, responsibility, and authority. Fourth, actively demonstrate support for good housekeeping practices through regular, positive reinforcement. In addition to verbal reinforcement use written commendation and awards to individuals, areas and departments that have been found to be effective. If you can measure the degree of cleanliness, you can manage it. This can be accomplished by housekeeping audits using an audit instrument similar to Figure 9-1.

If you decide to make the housekeeping committee responsible for initiating proper housekeeping practices, to implement them and report on their results or needed change to management, they will need to do the following:

- Inspect the facility to set up a baseline for the current level of housekeeping.
- Recommend the appropriate acceptable level of cleanliness for approval.
- Evaluate the present cleaning services and make recommendations.
- Change any errant methods and make sure all cleaning equipment and needed supplies are provided.
- Set up accountability and responsibility to maintain and carry out cleanliness tasks.
- Determine if there is adequate staffing to assure proper housekeeping procedures.

HOUSEKEEPING AUDIT INSTRUMENT

- ☐ Individual Workstation for: _____ Conducted by: _____
- ☐ Work Area covered: _____
- ☐ Department Name: _____ Date: _____
-
- ☐ Yes ☐ No Did you find waste materials improperly disposed? If problems exist specify: _____
- ☐ Yes ☐ No Were there approved containers for waste and recyclable materials? If problems exist specify: _____
- ☐ Yes ☐ No Did you find tripping hazards? If problems exist specify: _____
- ☐ Yes ☐ No Did you find slipping hazards? If problems exist specify: _____
- ☐ Yes ☐ No Were tools or equipment found to be improperly stored? If problems exist specify: _____
- ☐ Yes ☐ No Are aisles and emergency exits clear of material and debris? If problems exist specify: _____
- ☐ Yes ☐ No Are loose material or liquids found on floors? If problems exist specify: _____
- ☐ Yes ☐ No Are all supplies, products, or materials properly stored? If problems exist specify: _____
- ☐ Yes ☐ No Are materials stacked securely? If problems exist specify: _____
- ☐ Yes ☐ No Are janitorial services being performed adequately? If problems exist specify: _____
- ☐ Yes ☐ No Did the level of cleanliness meet company specifications? If problems exist specify: _____
- ☐ Yes ☐ No Is the individual's workstation free of debris or litter? If problems exist specify: _____
- ☐ Yes ☐ No Are materials found in the individual's workstation properly stored? If problems exist specify: _____

Figure 9-1. Housekeeping audit instrument.

- Schedule and organize periodic audits and inspections for cleanliness.
- When conducting an audit look at yards, basements, utility rooms, closets, and remote storage areas. It should also look at areas that are unoccupied at present.
- Keep management apprised of the status or progress after each audit.

Proper housekeeping controls waste, leakage, and vapors to prevent accumulations that can lead to increased losses. Such accumulations have one or several causes:

- Trash or debris left because of carelessness.
- Trash or debris resulting from an inadequate pickup schedule.
- Dust or other materials released from normally closed containers or systems.
- Leakage of process or lubricating fluids, steam or condensate.
- Improper or inadequate removal of accumulated process wastes and residues.

Proper housekeeping also controls storage or placement of tools and materials. Although it might be tempting to use the “free space” in electrical areas, boiler rooms, compressor areas, or other equipment rooms for the storage of brooms, paint, spare parts and various utility and maintenance supplies, it is essential to resist such practices. Suitable broom closets, paint lockers, spare parts storerooms, and utility rooms should be constructed for such contents.

PREVENTIVE HOUSEKEEPING

Good housekeeping is an important element of accident prevention in offices. Poor housekeeping may lead to fires, injuries to personnel, or unhealthful working conditions. Mishaps caused by dropping heavy cartons and other related office equipment and supplies, inadequate housekeeping causing tripping or stumbling hazards could also be a source of serious injuries to personnel.

In general, passageways in offices should be free and clear of obstructions. Proper layout, spacing, and arrangement of equipment, furniture, and machinery are essential. All aisles within the office should be clearly defined and kept free of obstructions. Chairs, files, bookcases and desks must be replaced or repaired if they become damaged. Damaged chairs can be especially hazardous. Filing cabinet drawers should always be kept closed when not in use. Heavy files should be placed in the bottom file drawers.

Materials stored within supply rooms must be neatly stacked and readily reached by adequate aisles. Care should be taken to stack materials so they will not topple over. Under no circumstances should materials be stacked within 18 inches of ceiling fire sprinkler heads or Halon nozzles. Materials should not be stored so that they project into aisles or passageways in a manner that could cause persons to trip or could hinder emergency evacuation.

HOUSEKEEPING AND FIRE

Since most offices are filled with combustible materials, it is imperative that as little of litter as possible be maintained and waste paper be recycled to outside containers to be recycled. Suffice it to say that not all the combustible material can be disposed of. The company or building owner should not tolerate the stacking of combustible near heat sources, on electrical cords, or blocking walking/working areas. Fire is very common in office buildings and the more fuel the larger the fire. Thus, companies need to develop and enforce rules and policies regarding housekeeping in order to remove potential fire hazards.

WASTE DISPOSAL

Office personnel should carefully handle and properly dispose of hazardous materials, such as broken glass. A waste receptacle containing broken glass or other hazardous materials should be labeled to warn maintenance personnel of the potential hazard. It is the owner or employer's responsibility to have an adequate waste disposal system available, as well as a recycling procedure that provides an adequate number of appropriately labeled containers for disposal and recycling (see Figure 9-2).



Figure 9-2. Waste and recycling containers in office building hallway.

INDIVIDUAL WORKSTATIONS

The employer should hold each of its employees responsible for the housekeeping of its own offices, cubicles, or workstation. The employer should not allow a workstation that is cluttered with debris and waste to exist. See Figure 9-3 for an example of such a work area. It should hold the employee accountable for the housekeeping in his or her work area and take any disciplinary action needed to achieve compliance with company standards. Not only does the office area in Figure 9-4 pose safety and fire hazards, it also reflects badly on the company when guests or visitors see such an office. It is definitely an embarrassment for the company.



Figure 9-3. An inappropriately maintained workstation regarding housekeeping.

Offices that take on the appearance of the one in Figure 9-4 are much more acceptable from a housekeeping perspective.



Figure 9-4. An office that demonstrates good housekeeping practices.

GENERAL HOUSEKEEPING GUIDELINES

Office areas are to be kept neat and orderly. The following general rules are to prevent injuries, decrease property damage, and maintain a professional appearance:

- All aisles, emergency exits, fire extinguishers, etc., will be kept a minimum of three feet of either side of material storage (temporary or permanent) at all times.
- Storage areas will be maintained orderly at all times. When supplies are received the supplies will be stored properly.
- Spill will be cleaned-up immediately and waste disposed of properly.
- All waste receptacles will be lined with plastic trash bags to avoid direct contact while handling. Custodial employees will use rubber gloves and compaction bars when handling waste.
- Keep file and desk drawers closed when not attended to avoid injuries. Open one drawer at a time to prevent tipping of file cabinets.
- At the end of the business day, turn off all office equipment (area heaters, lamps, coffee-makers, personal computers, etc.) and light to save energy and prevent fires. All space heaters should be unplugged at the end of the day to assure they have been turned-off.

EFFECTS FROM POOR HOUSEKEEPING

Poor housekeeping also increases electrical and mechanical breakdown loss potential. Even without considering the possibility of a resulting fire or explosion, electrical and mechanical breakdowns can result in destruction of major equipment. Poor housekeeping affects property and can lead to breakdown in other ways:

- Accumulations of dust and other debris can create a thermal blanket that prevents adequate cooling of electrical equipment and causes the equipment to fail or run hotter at reduced efficiency and with reduced life expectancy.
- Oil, grease and other contaminants can damage electrical insulation on cables and in motor windings.
- Dirt, soot, moisture and other contaminants can provide paths for flash-over or short circuiting electrical equipment.
- Accumulation of water, certain vapors and other materials can damage paint and promote corrosion. Undetected corrosion has led to building collapse, pressure vessel failure, and electrical breakdown.
- In machinery, debris of any sort can lead to accelerated wear or direct breakdown.

Poor housekeeping increases loss potential. Products can be contaminated. Scrap, leakage, and other waste that gets into or on a product can affect the quality of a product and its failure to meet acceptable client level and ultimate rejection (see Figure 9-5).



Figure 9-5. Poor housekeeping in meeting room.

SUMMARY

Poor housekeeping directly affects the property and the perceived reliability of the output of the business. The loss of property and productivity can be significant. In direct effects of adverse housekeeping problems people tend to work more slowly and are less accurate. It also decreases productivity and morale. Even firefighting and loss control efforts are obstructed by this issue.

Perhaps the most difficult part of a proper housekeeping program is the establishment of a desired level of cleanliness. The first barrier to overcome is the notion that the level of cleanliness cannot be improved. A key point in establishing cleanliness level is to determine whether it is possible to eliminate sources of waste or leakage. Thirdly, clutter results when there is inadequate management emphasis on maintaining good housekeeping. More space may be needed but if space is available then possibly the employee needs training.

Proper housekeeping does not just happen. It requires the leadership and the wholehearted support of management and the cooperation of employees. When this effort is made, an increase in employee productivity will likely more than cover the increased cost. In addition, a major factor contributing to the severity of fires, explosion, collapse, and other perils will be minimized.

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CHAPTER 10

MATERIAL HANDLING AND LIFTING



Use of a hand truck for material handling tasks.

MATERIAL HANDLING

The handling of all types of materials may manifest itself in the individual worker's effort to lift or move those materials using large industrial cranes. No matter which procedure is used, there are hazards and safety concerns that need to be addressed.

Almost every industry sector has to address material handling issues. This is equally as true for the office building work environment. These materials may be anything from boxes, parts, and equipment.

The efficient handling and storage of materials is vital to the function of an office building environment. Material handling operations provide for the continuous flow of materials, supplies, and products throughout the workplace that assures that materials and products are there when they are needed. Yet the improper handling and storage of materials can cause costly injuries.

The proper and safe handling of a wide variety of materials must be done in compliance with existing Occupational Safety and Health Administration (OSHA) regulatory requirements for the equipment to be used, the methods or procedures to be followed, as well as the appropriate storage of each type of material.

More employees are injured in the American industry environment while moving materials than performing any other single function. These injuries have been estimated to account for 20 to 25 percent of all occupational injuries.

Material handling is one of the most frequently occurring hazards in all industry sectors. The accident could be a back injury or as catastrophic as the collapse of stored materials onto a worker, which could result in multiple loss of life and extensive property damage. When an average back injury costs \$9,000 (the most common body part injured by workers) and the cost of one fatality is approximately \$1,000,000, most companies cannot absorb these types of financial losses or the loss of resources from these occurrences. These resources are in the form of loss production, human suffering, and real dollar costs that quickly get the attention of owners and investors as well as the workers.

These soaring costs have triggered attention to occupational safety and health beyond the regulatory requirements of OSHA. It seems safe to say that material handling safety and health in the workplace is everybody's business and can have a detrimental effect on the bottom line. Thus, any attention paid to safety handling of materials will result in a pay off.

When one thinks of the ominous task of trying to address effectively the needs of those faced with material handling issues, it may seem almost insurmountable. Estimates by OSHA and the Bureau of Labor Statistics (BLS) suggest that in the United States there are at least 6.5 million different workplaces and some 100 million workers who suffer 6 million injuries per year. This makes the task more difficult with so many workplaces existing. This makes for a great deal of diversity when one considers material handling issues.

HAZARDS INVOLVED

The effects of the hazards faced by those performing material handling tasks may be something as simple as overexertion that results in sprains or strains to simple cuts and lacerations due to sharp edges or contact with moving parts on equipment. The pinch (nip) points or shear weight of items being handled can result in bruises, contusions, crushing, fractures, and amputations. The larger the object, the larger the equipment being used, the faster the movement of materials, thus the greater the risk for multiple injuries, suffocation, or worst of all death.

Many of the materials being handled by workers are hazardous chemicals, which may present both an injury and illness potential. Many chemicals are fire or explosion hazards which can result in burns or concussion injuries. Others may present the potential for contact, ingestion, or inhalation exposures, which may cause allergic reactions or toxic (poisonous) effects in workers when such materials are mishandled and/or spilled.

It certainly seems safe to say that all of these scenarios have transpired at one time or another as workers handled these types of materials. It appears worthwhile to expand this discussion of material handling hazards to the accidents/incidents caused by them. Certainly, if some materials are too heavy and a lot of repetitions of lifting occur, the potential for overexertion will likely ensue with sprains/strains.

Materials that are improperly stored or handled have the potential to shift due to their weight, shape, or stacking procedures. When material shifts, it may physically strike a worker, pinning him/her between a stationary object and the moving materials.

When using the wide variety of equipment available to move or handle the different types of materials, which exist in the workplace, the unevenness, unsecured loads, and heavy weight still have inherent hazards with their use. The use of equipment to handle materials is controlled by lifting or load limits of the equipment or supporting capacity of storage (shelving) units which can never be exceed if safety is a primary focus. Assurance must exist that the proper equipment is used for the job. Equipment must be used for its intended use by those making us of it.

The last hazard is derived from the myriad of chemicals that exist and are handled or stored within the workplace. Not only do they present the potential to cause physical harm as noted earlier when chemical containers shift, roll, or strike a worker injuring or killing that worker, many of these chemicals have another type of hazard posed by them. It is the potential to be toxic (poisonous) or cause burns if mishandled or spilled and then not properly controlled. Some of these chemicals have the likelihood to create an explosion or fire.

As can be seen, the movement, stacking, and storage of materials pose many hazards within the workplace. The philosophical approach to these hazards must be that we can identify them, and we can prevent the accidents/incidents that result in injuries, illnesses and deaths from improper material handling.

Types of Equipment Being Used Today

Probably few facets of safety and health have such a wide variety of equipment with which to be concerned as material handling. Some of these are as simple as a handcart or dolly to as complex as industrial robots. Some robotic systems are used in the office environment to delivery and pick up mail.

A mechanical advantage can be gained by using powered equipment. In most office workplaces only your maintenance, loading dock, and ground crews would be using power-assisted material handling equipment such as forklifts, powered pallet truck, or tractors.

As can be noted, material-handling equipment creates a continuum from the most primitive lever devices (still quite useful) to the state of the art modern industrial robots. Each type of equipment from the simplest to the most complex comes with its own unique safety and health problems or hazards. Thus, the type(s) of equipment being used will determine how the safety and health concerns will be addressed in order to prevent the accidents, injuries, illnesses, and potential deaths associated with the equipment being used during material handling at the workplace and worksites. For many types of material handling equipment there are mandatory OSHA regulations and requirements to assure equipment safety and accident prevention.

MATERIAL HANDLING OSHA REGULATIONS

The most often utilized regulations are the General Industry (29 CFR 1910) for the office environments. The specific regulations, which are applicable to material handling within the general industry (29 CFR 1910) are as follows:

Subpart H—Hazardous Materials

910.101—Compressed gases

910.102—Acetylene

910.103—Hydrogen

910.104—Oxygen

910.105—Nitrous oxide

910.106—Flammable and combustible liquids

910.110—Storage and handling of liquified petroleum gases

Subpart J—General Environmental Controls

910.144—Safety color code for marking physical hazards

910.145—Specifications for accident prevention tags

Subpart N—Material Handling and Storage

910.176—Handling materials—general

910.178—Powered industrial trucks

Although other 29 CFR 1910 regulations are tangentially related to material handling and apply to most workplaces, the previous list included the ones most applicable to material handling.

TRAINING REQUIREMENTS

Training is often a requirement within the Occupational Safety and Health Administration's (OSHA) safety and health regulations. At times the requirements are mandatory and at other times they are recommendations. There are definite requirements for all workers to be trained regarding the hazards of their particular job. It is of little good to have trained workers if the supervisors are not trained and expected to follow and enforce the appropriate safety and health requirements and rules.

Training of workers and supervisors has been shown to have a positive effect on the reduction of accidents and incidents within the work environment. Thus, the investment in training is by all means an important part of a good safety and health initiative. This is especially true when one considers the number of accidents or incidents related to material handling that transpires and impacts upon the bottom line (profit).

The requirements for training relevant to material handling can be found at the OSHA website (<http://www.osha.gov>) under publications. The OSHA training requirements in *OSHA Standards and Training Guidelines (OSHA 2254)* is the document that will provide you with this type of information. The onus is placed upon the employer to ensure that his/her employees are adequately trained to perform their work in a safe and healthy manner. The newest and most specific training requirements are those for industrial truck (forklift) operators and should be reviewed and complied with.

Training does cost money and time. It should be carefully planned to meet the specific material handling needs of the supervisor and employees. The training should be evaluated to assure that it has accomplished its purpose. Retraining should be done when the original training has not been effective or new procedures have arisen. Make all of your training worthwhile by designing it for your operation and expecting the supervisor and workers to use it.

MATERIAL HANDLING/LIFTING PROGRAM

In the field of occupational safety and health, programs and policies must be formalized for communication, compliance, and implementation to take place. In most cases this takes the form of a written program or policy which can be available to everyone and thus foster a better understanding as to the intent of the company's, contractor's or institution's stand on that particular issue.

In light of this previous statement, it is recommended that the employer develop a written formalized program to address concerns regarding the safety and health issues that arise related to material handling or lifting.

First, employers must state their policy related to safety and health issues and material handling/lifting. This should include what procedures are to be followed, which will vary greatly for office buildings versus general industry. Also, the maximum weight which individuals are expected to lift, as well as when an individual should call for help or use special devices for handling loads beyond the prescribed limit.

Secondly, an employer should assure that workers and supervisors are trained to identify potential hazards as well as have a procedure set in place for reporting these hazards and a follow-up mechanism to provide feedback on reported hazards. Some individuals with the appropriate expertise should be assigned responsibility for evaluating the reported hazards and responding to them.

Thirdly, a system for addressing solutions for intervention and prevention of these hazards must exist. This could be the responsibility of your responsible person or that of a team of employees and/or supervisors. A mixed team of employees and supervisors will probably elicit the best solutions as well as the most commitment to implementation and compliance of intervention strategies.

Fourth, employers must assure that workers have received training related to employers' material handling/lifting policy and procedures. Workers are expected to follow as well as know the purpose and intent of the employers' program. Employees must be trained on the materials handling hazards, lifting hazards, the proper material handling/lifting procedures, and the safe and proper use of equipment that they must use to perform their material handling/lifting duties and tasks. Supervisors should receive the same type of training. It is often the opinion of both the employers and the supervisors that supervisors are already adequately trained but studies often indicate that the contrary is the case. Most workers and often their supervisors feel that more training for supervisors has positive benefits.

This is only a short presentation on material handling/lifting programs. It is sufficient to say that using an organized approach to material handling should be viewed as a necessity rather than a luxury in the eyes of the employer, supervisors and the workers themselves. Efforts to prevent the occurrence of accidents and incidents involving material handling/lifting are dependent on formal programs to pro-

vide a foundation for everyone in mitigating these expensive types of injuries from material handling.

LIFTING IN OFFICE WORKPLACES

Strains and Overexertion

Although a typical office job may not involve lifting large or especially heavy objects, it's important to follow the principles of safe lifting. Small, light loads (e.g., stacks of files, boxes of computer paper, books) can wreak havoc on your back, neck, and shoulders if you use your body incorrectly when you lift them. Backs are especially vulnerable; most back injuries result from improper lifting. Before you pick up a carton or load, ask yourself these questions:

- Is this too heavy for me to lift and carry alone?
- How high do I have to lift it?
- How far do I have to carry it?
- Am I trying to impress anyone by lifting this?

If you feel that the lift is beyond your ability, contact your supervisor or ask another employee to assist you (see Figure 10-1).



Figure 10-1. Typical lifting of materials in an office setting.

Safe Lifting Steps

It is not safe to assume that office workers know how to lift properly. All workers should be trained in safe lifting practices. This training should be reinforced by calling attention to workers when they are performing a lift in an improper manner. There are some basic steps that should be followed in performing a lift.

- Take a balanced stance, feet placed shoulder-width apart. When lifting something from the floor, squat close to the load.
- Keep your back in its neutral or straight position. Tuck in your chin so your head and neck continue the straight back line.
- Grip the object with your whole hand, rather than only with your fingers.
- Draw the object close to you, holding your elbows close to your body to keep the load and your body weight centered.
- Lift by straightening your legs. Let your leg muscles, not your back muscles, do the work.
- Tighten your stomach muscles to help support your back.
- Maintain your neutral back position as you lift.
- Never twist when lifting. When you must turn with a load, turn your whole body, feet first.
- Never carry a load that blocks your vision.
- To set something down, use the same body mechanics designed for lifting.

Lifting from a Seated Position

Bending from a seated position and coming back up places tremendous strain on your back. Also, your chair could be unstable and slip out from under you. Instead, stand and move your chair out of the way. Squat and stand whenever you have to retrieve something from the floor.

Ergonomic Solutions to Back-Breaking Tasks

Some solutions for lessening the potential for sprains, strains, and back injuries are provided:

- If you are doing a lot of twisting while lifting, try to rearrange the space to avoid this. People who have to twist under a load are more likely to suffer back injury.
- Rotate through tasks so that periods of standing alternate with moving or sitting. Ask for stools or footrests for stationary jobs.
- Store materials at knee level whenever possible instead of on the floor. Make shelves shallower (12–18") so one does not have to reach forward to lift the object. Break up loads so each weighs less.
- If you must carry a heavy object some distance, consider storing it closer, request a table to rest it on, or try to use a hand truck or cart to transport it (see Figure 10-2).



Figure 10-2. Use of a material-handling cart to move heavier items.

MATERIAL STORAGE IN OFFICES

Office materials that are improperly stored can lead to objects falling on workers, poor visibility, and fire hazard. A good housekeeping program will reduce or eliminate hazards associated with improper storage of materials. Examples of improper storage include: disorderly piling, piling materials too high, and obstructing doors, aisles, fire exits and fire-fighting equipment. The following are good storage practices:

- Store heavy objects on lower shelves.
- Try to store materials inside cabinets, files, and lockers.
- Office equipment such as typewriters, index files, lights or calculators should not be placed on the edges of a desk, filing cabinet, or table.
- Aisles, corners, and passageways must remain unobstructed. There should be no stacking of materials in these areas.
- Storage areas should be designated and used only for that purpose. Store heavy materials so you do not have to reach across something to retrieve them.
- Fire equipment, extinguishers, fire door exits, and sprinkler heads should remain unobstructed. Materials should be at least 18 inches minimum away from sprinkler heads (see Figure 10-3).



Figure 10-3. Neatly stored office materials.

Boxes, papers, and other materials should not be stored on top of lockers or file cabinets because they can cause landslide problems. Boxes and cartons should all be of uniform size in any pile or stack. Always stack material in such a way that it will not fall over (see Figure 10-4).



Figure 10-4. Poorly stored office materials.

SUMMARY

The specific office situation matters little; all offices have materials that need to be handled, lifted, and stored. Finding ways to accomplish these tasks in a safe manner is critical to the overall smooth function of any office environment. Since in many office environments handling and lifting heavy materials is not part of the normal job requirements. At times the workers are not accustomed to these types of activities and are not conditioned to carry them out. There needs to be a policy in place to handle these types of activities. The types of injuries from poorly stored material, lifting and handling heavy or awkward materials are often serious and disabling to worker.

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CHAPTER 11

DESIGNING OFFICE WORKPLACES



No matter the design of the office building the integral components are always the same.

Many factors come into play when designing office buildings for safety and health. These include the architect's design, construction itself, internal components, the workplace design, and all that is brought into the office building to make it habitable. At each stage along the way, designing in safety and health is crucial to making a safe and healthy workplace. The process should include the design entrances, building areas, and facilities for access by those disabled and those who fall under the auspices of the Americans with Disability Act (ADA).

ARCHITECT'S DESIGN

The architect must design into the office building such items as adequate:

- Exits.
- Stairs.
- Ventilation.
- Sanitary facilities.

- Space for the proposed population of workers.
- Lighting and emergency lighting.
- Fire suppression systems.
- Fire-pull boxes.
- Fire alarm system.
- Electrical service
- Security system.
- Processing space.
- Storage space.

Besides being designed to meet safety and health concerns, a building's layout should work for the occupants, staff, and visitors. It is interesting to note that many factors need to be viewed from a safety and health perspective in order to accomplish a safe and healthy office building. In the following subsections a few of these are discussed.

Exits and Entries

Provide as many private, ground-level entries to individual units as possible. Ensure that all building entries are prominent and visible and create a sense that the user is transitioning from a public to a semi-private area. Avoid side entries and those that are not visually defined. At all entries consider issues of shelter, security, lighting, durability, and identity as prime considerations (see Figure 11-1). Allow visual access to stairs and elevators from the lobby that will be more protective for those using them. For buildings with clustered and individual unit entries, consider providing small "porch" areas that the company or workers can personalize with signs or greetings, etc. Limit "shared entries" as much as possible since they create a security issue. Consider providing some form of storage for bicycles and other personal items at or close to all main entries.



Figure 11-1. Open but protected entrance to an office building.

Central Facilities and Common Rooms

Consider locating central facilities—such as lunchrooms and meeting rooms—in a central part of the office building. Common rooms should be linked to common outdoor space. Ensure that these types of rooms are comfortable, accessible, durable, and, most importantly, flexible places. By being centrally located, better security can be maintained for offices clustered around them. These types of rooms should have access to restrooms, a kitchenette, telephone, and should have good storage for audio-visual equipment, etc. Provide as much access to daylight and natural ventilation in all common rooms as is possible (see Figure 11-2).



Figure 11-2. Common area in the lobby of an office building.

Support and Service Areas

Carefully consider the design and location of key support/service areas such as the building manager's office, security office, maintenance rooms, janitor's facilities, mechanical equipment rooms and trash collection areas. Provide access to bathrooms and kitchens, and adequate space, quality furniture and extra storage—this is always an issue in an office building regarding housekeeping and proper storage—for each of these uses, together with access to bathrooms and kitchens. Planning of these spaces must be accomplished so that adequate space is part of the design. The manager's office should supervise the main entrance and should be located centrally, next to operational areas, e.g., security and maintenance rooms. Provide screened trash collection areas that are convenient and easy to access by all occupants. Consider the path of travel of trash from source to removal area. This can become a hygiene problem as well as a housekeeping issue.

Stairs and Stairways

Ensure stairs are durable, attractive and safe. Avoid treating stairs as an af-

terthought. Instead, consider them, particularly entry stairs, as major design elements. Consider how they relate to the street and neighborhood, how they accommodate users and visitors, and what they “say” about the project and its occupants. Consider how the area under the stairs will look and be used. Ensure that all stairs can accommodate moving furniture without damage to finishes (see Figure 11-3).



Figure 11-3. Adequately designed stairway.

Stairs should have a landing approximately every 12 feet and should be wide enough to provide a minimum of 44 inches. It is critical that variations in riser height, or tread depth not vary over 1/4 of an inch. Variation in these two factors to any degree even for one step will lead to numerous accidents (falls primarily).

All hand rails and stair rails should not be less than 36 inches high. If stairs are very wide, a third rail in the center of the stairway provides an element of safety.

It is best if all doors entering and leaving a stairway open in the way of downward travel for emergency evacuations. All doors should have a panic bar opening mechanism and absolutely no locks of any kind. Stairs that are used for evacuation should open directly onto open areas or onto the street.

Elevators

Locate elevators in sight of manager's office or security station if possible. Design elevators so that access to them is in a dead-ended corridor with entry and egress only through the lobby. Design adequate space in front of elevator to allow waiting and passage. Passenger safety is discussed in the safety portion of this book (see Figure 11-4).

Access Corridors

Corridors should not be less than 44 inches wide. Access corridors should



Figure 11-4. Office elevators with adequate waiting area and visible from the lobby.

not be of excessive length: i.e., no greater than 100 feet unbroken length. Break up long corridors with lobbies, lighting, benches, materials, color changes, offsets, or artwork. To the best extent possible, provide corridors with access to natural daylight and ventilation. Ensure that all corridors can accommodate moving furniture without damage to finishes. Make sure that corridors that provide a route of escape do not have any design impediments.

Electricity

Strategically placed and an adequate number of electrical outlets to service all offices and office spaces should be available in today's office environment. This will help prevent the use of extension cords, overloading receptacles, and wires from becoming tripping and fire hazards. By designing office space and cubicles and their furnishings prior to installation of electrical service, you will mitigate many of the issues faced in securing electricity to operate the modern offices of today in a safe manner.

Lighting

In modern offices illuminance levels are commonly in the range of 10 to 100 foot-candles. Good lighting depends on more than just illuminance levels. The direction, distribution, color, and color-rendering index are all sources that contribute to effective lighting (visibility). Illumination levels are generally dictated by the needs of the visual task. Typically, the more light available, the easier it is to perform a specific task. How much light is enough depends upon many factors:

- Details of task.
- Reflection and contrast (task and background).
- The eye (age and condition).
- Importance of speed and accuracy.

The Illuminating Engineering Society (IES) has published levels of illumination that are deemed appropriate for certain tasks. Examples of recommended levels can be found in Figure 11-5.

IES ILLUMINATION RECOMMENDATIONS	
Activity	Foot-candles
Public spaces with dark background	2–5
Simple orientation for short temporary visits	5–10
Working spaces where visual tasks are only occasionally performed	10–20
Performance of visual tasks of high contrast or large size	20–50
Performance of visual tasks of medium contrast or small size	50–100
Performance of visual tasks of low contrast and very small size	100–200
Performance of visual tasks of low contrast or very small size over a prolonged period	200–500
Performance of very prolonged and exacting visual tasks	500–1000
Performance of very special visual tasks of extremely low contrast	1000–2000

Figure 11-5. IES recommended levels of illumination.

Proper workplace lighting is essential to any good business:

- It allows employees to see comfortably what they’re doing without straining their eyes or their bodies.
- It makes work easier and more productive.
- It draws attention to hazardous operations and equipment.
- It helps prevent costly errors and accidents.

Proper lighting is also required by law. There must be sufficient light in the workplace to ensure the safety of every worker. There must be adequate levels of light to allow workers to perform their task in a safe manner as well as back-up lighting in an emergency or power failure. To access whether lighting is sufficient in the workplace, consider these factors:

- Human factors.
- Area to be lit.
- Task to be done.
- Equipment and furniture used in tasks (see Figure 11-6).

CHECKLIST FOR PROPER LIGHTING		Recommendations
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are work areas free of shadows?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Can employees comfortably see their work without straining?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	If task lighting is provided, is it adjustable?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Is the intensity adjustable?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are work areas, including computer workstations, free of glare?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are dangerous pieces of equipment and areas well lit to alert employees to the hazard?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are workers given enough time to perform visual tasks (for example, if they have to move from bright to dimly lit areas)?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Is there adequate contrast between the workplace and its surroundings?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Have lighting adjustments been made for people with visual limitations?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are the lighting needs of older workers met?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are lights measured regularly for level of illuminance?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are lighting units and workplace surfaces (for example, walls) cleaned regularly?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are bulbs replaced before they burn out?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Does the emergency lighting system work properly?	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are employees given adequate information and training on the effective use of lighting?	_____

Figure 11-6. Checklist for proper lighting.

Emergency Lighting

Emergency lighting is required in:

- Exit paths inside office buildings and areas that are two or more stories high.
- Exit paths inside industrial buildings or areas (such as a laboratory or shop).
- Elevators.

Emergency lighting systems must provide one or more foot-candles throughout an exit path for at least 1.5 hours after a power outage occurs. Areas without natural light and areas where hazardous operations are conducted must have adequate emergency lighting to permit personnel to exit during an outage (see Figure 11-7).



Figure 11-7. Emergency lighting is a necessity.

Emergency lighting may also be installed in areas that may otherwise be hazardous to exit during a power failure. Emergency lighting systems may be either battery- or generator-powered. A maximum delay of 10 seconds is permitted for emergency lighting provided by an electrical generator. Non-generator powered emergency lights are to be tested monthly.

Indoor Air Quality

Given that the sealed office building is a fact of life for many workers today, office staff depends on smoothly functioning ventilating, air conditioning, and heating systems to maintain the quality of indoor air. These systems keep buildings cool in summer and warm in winter. They bring fresh air in from the outside to help prevent the dangerous buildup of CO₂ and vent substances from newly painted walls, new carpet, and new furnishings.

It is important that the quality of this air be controlled by testing and determining temperature, humidity, airflow rates, harmful gases, and substances such as microbials and particulates. Indoor air quality systems must protect workers from pesticide spraying, terrorist attacks using nuclear, biological or chemical means, and releases from nearby industries or other release sources.

Security

Consider ease of visual and physical surveillance by the residents of areas such as the street, the main entrances to the site and the building, public open space and parking areas. Consider locating windows from actively used rooms such as common areas, meeting rooms, and lunch rooms so that they look onto key areas. Also consider containing open spaces within the building layout and using the selection and layout of plant materials to enhance, rather than hinder, surveillance and security. Consider specific design strategies to maximize the security of the building, including adequate lighting, lockable gates and doors at all entrances to the site and the buildings, and video cameras and monitors.

Consult with a security expert to insure that all electrical/electronic security systems are hard-wired and other security measures are installed during the building process to preclude the after-market expenses of having to retrofit the building.

FIRE SAFETY DESIGN

The Life Safety Code (NFPA 101) from the National Fire Protection Association provides minimum requirements for the design, operation, and maintenance of buildings for safety to life from fire and similar emergencies. The code requires new and existing buildings to allow for “prompt escape” or to provide people with a reasonable degree of safety through other means. Figures 11-8 and 11-9 provide a checklist for the Life Safety Code and hazardous materials.

LIFE SAFETY CODE CHECKLIST

The purpose of the Life Safety Code is to establish minimum requirements that will provide a reasonable degree of safety from fire in buildings and structures. This checklist is provided to assist you in identifying Life Safety Code Violations.

Please remember, though you may not be an expert in life safety, your inspection input is important. A little common sense goes a long way. Look around, imagine there was a fire and look for potential problems. If you’re not sure about something, write it down on this checklist. The following checklist is to be used as a guide. “Yes” indicates compliance and “No” indicates an issue to address.

Department Fire Plan and Evacuation Map

- ☐ Yes ☐ No Is there a narrative fire plan and does it include the actions to be taken in case of fire?
- ☐ Yes ☐ No Is there a fire evacuation map and does it include:

- ☐ Yes ☐ No A sketch of all rooms in the office area?
- ☐ Yes ☐ No A marking "You are here"?
- ☐ Yes ☐ No Red arrows showing primary evacuation route and yellow arrows showing secondary route?
- ☐ Yes ☐ No Identify exterior exits for each route?

NOTE: Evacuation maps are not required in all spaces, only in hallways where exits are not visible or obvious, and areas where the evacuation route is not obvious or is unfamiliar to personnel or visitors.

Monthly Inspection of Fire Extinguishers

- ☐ Yes ☐ No Are all extinguishers serviceable insuring that hoses are not cracked, nozzles obstructed, or seal broken?
- ☐ Yes ☐ No Is the pressure gauge in the operable range?
- ☐ Yes ☐ No Are Fire Extinguisher Inspection Records available?
- ☐ Yes ☐ No Has the extinguisher been checked every month and initialed?

Electrical Systems

- ☐ Yes ☐ No Are electrical cords in serviceable condition, i.e., not twisted, frayed, spliced, knotted, tacked, or stapled to wall?
- ☐ Yes ☐ No Are extension cords not used?
- ☐ Yes ☐ No Are all coffee makers on a nonflammable surface, with a safety check and an authorization to use them in the lunchroom?
- ☐ Yes ☐ No Are authorized adapters used on electrical plugs?
- ☐ Yes ☐ No Are all personal electrical devices inspected and bear a safety sticker with inspector's initials and date?

Flammable/Combustible Liquids and Gases

- ☐ Yes ☐ No Are compressed gas cylinders (oxygen, carbon dioxide, nitrous oxide, etc.) chained (secured) so as to prevent falling?
- ☐ Yes ☐ No Are flammable storage cabinets marked "FLAMMABLE MATERIAL"?
- ☐ Yes ☐ No Do all compressed gas cylinders not in use have a cylinder cap?

Exits

- ☐ Yes ☐ No Are fire doors propped open?
- ☐ Yes ☐ No Are all exits clearly marked, illuminated and operational?
- ☐ Yes ☐ No Are all exits easily opened?
- ☐ Yes ☐ No Are all hold-open mechanisms in working order and do all doors close entirely?

- ☐ Yes ☐ No Do all corridors or passageways required for exit access have a 44-inch clear path of travel?
- ☐ Yes ☐ No Do smoke barrier doors (metal double doors in main passageways) have a gap of less than 4 inches when closed?
- ☐ Yes ☐ No Is anything blocking fire exit doors?

Staff Safety

- ☐ Yes ☐ No Are precautions taken to insure that floors are clean and clear?
- ☐ Yes ☐ No Are any wastebaskets constructed of flammable material?
- ☐ Yes ☐ No Is biohazard waste disposed of in the proper receptacle?
- ☐ Yes ☐ No Are there any portable heaters in the office area?
- ☐ Yes ☐ No Are storage areas neat and clean?
- ☐ Yes ☐ No Are all ceiling tiles in place?
- ☐ Yes ☐ No Are there any visible stains on ceiling tiles?
- ☐ Yes ☐ No In sprinkler areas, is material stored closer than 18 inches from the ceiling?
- ☐ Yes ☐ No Were all new employees briefed on the hazards of their job and action documented?
- ☐ Yes ☐ No Is eating and drinking prohibited where toxic or infectious wastes are routinely present?

Figure 11-8. Checklist for the Life Safety Code.

Hazardous Materials Checklist

This checklist is required for monthly inspections as part of the life safety inspection for all areas having hazardous materials storage cabinets and rooms. Continue to the end of the checklist if these entries do not apply. "Yes" indicates compliance and "No" indicates an issue to address.

Cabinet

- ☐ Yes ☐ No In locations where flammable vapors are present, are precautions taken to prevent ignition by eliminating or controlling the sources of ignition?
- ☐ Yes ☐ No Are storage cabinets designed to limit internal temperatures to a maximum of 325 degrees F when subjected to a 10-minute fire test?
- ☐ Yes ☐ No Are metal and wooden cabinets designed to meet OSHA and NFPA standards?
- ☐ Yes ☐ No Are the cabinets in good condition with no cracks, tears, corrosion, or missing parts?

- ☐ Yes ☐ No Are any liquids or materials leaked onto the shelves?
- ☐ Yes ☐ No Are the shelves in good condition with no bends or sagging?
- ☐ Yes ☐ No Are no more than four cabinets stored next to each other?
- ☐ Yes ☐ No Do the doors close by themselves completely?
- ☐ Yes ☐ No Are the cabinets properly labeled for the materials stored, e.g., flammables, corrosives, acids?
- ☐ Yes ☐ No Do the cabinets contain materials other than the hazardous materials designated for storage? (Example: Tyveks stored with formalin)
- ☐ Yes ☐ No Is personal protective equipment stored in the cabinets?

Chemicals

- ☐ Yes ☐ No Do all containers of hazardous materials have readable and non-stained labels?
- ☐ Yes ☐ No Are the containers stored according to compatibility?
- ☐ Yes ☐ No Are the lids of the containers secured tightly with no cracks or breaks?
- ☐ Yes ☐ No Are the containers in good shape with no cracks or broken parts?
- ☐ Yes ☐ No Do any of the items in the lockers have expired shelf-life dates?
- ☐ Yes ☐ No Are no more than 5 gallons of Class I or II liquids or 1 gallon of Class III liquids stored in a storage unit locker?
- ☐ Yes ☐ No Are containers of hazardous materials stored **outside** the locker?

Spills and Disposal

- ☐ Yes ☐ No Are spill procedures located in the work area?
- ☐ Yes ☐ No Are personnel competent in knowing and demonstrating spill procedures?
- ☐ Yes ☐ No Are personnel knowledgeable in disposal procedures?

Figure 11-9. Hazardous materials checklist.

The Life Safety Code meets its objective by following two parallel approaches. First, it defines hazards, along with general requirements for the means of egress (a path of exit travel to a public way outside), fire protection features (such as fire doors), and building service and fire protection equipment (heating, ventilating, and air conditioning systems, sprinkler systems or fire detection systems, for example). Next, the Life Safety Code sets out life safety requirements that vary with a building's use. Buildings used for offices, for example, have a different life safety need than hospitals and schools.

Unique among fire safety codes, the Life Safety Code has different provisions, depending on the type of occupancy and whether the building is new or existing construction. The Life Safety Code can be used in conjunction with a building code or alone in jurisdictions that do not have a building code in place.

The Life Safety Code's objective is to provide safety to life during emergencies. However, two additional very positive spin-offs grew out of this objective.

- Many requirements that are designed to protect people also protect property, reducing the dollars loss associated with fire.
- Requirements that are designed to provide "prompt escape" during emergencies make buildings more pleasant during normal conditions. Spacious corridors and the convenience of multiple exits, for example, result from the requirement for "prompt escape."

The Life Safety Code requires unlocked and unobstructed exits, multiple exits, fire doors, and regular fire exit drills. These key provisions state:

- Locks and hardware on doors shall be installed to permit free escape.
- Exits must be marked with a sign that is readily visible.
- Any door in a means of egress must be capable of swinging from any direction to the full use of the opening. Door must swing in the direction of egress when serving a room or area with 50 or more occupants.
- Evacuation signals must be audible and visible.

INTERIOR DESIGN

Interior design can be viewed very narrowly or very broadly. It is more than esthetics related to beautification of the office building. It is an approach which looks for potential hazards and makes sure that you are not building in hazards or bringing hazards into the office work environment. Also, it considers safety during the purchasing process. This may seem simple but it does take a concerted effort to make it a priority. The cheapest is not always the safest and healthiest.

The interior of the building must be designed to be free of hazards as much as feasibly possible. Such items as the following must be part of the interior design:

- Safety glass for door and walls.
- No protrusions into walkways, offices, corridors, etc.
- Non-skid surfaces as much as possible.
- No access to exposed electrical circuit.
- Cover over all lights.
- Use of ramps for the handicapped or disabled.
- Non- allergenic materials for walls, floors, ceiling, furniture, windows, etc.
- Walls, shelves, and dividers securely anchored.
- Fall hazards guarded by rails or other means.
- No sharp edges.
- Handicapped hygiene facilities.
- GFCIs guarding electrical circuitry near water sources.
- Adequate numbers of electrical receptacles.

FURNISHINGS

Since most of the office staff will be using and surrounded by the furnishings, the purchasing and procurement of all office furniture should be undertaken with use, safety, and health in mind. Making sure the office furniture will support its use by office staff is important. It should be constructed with industrial use in mind. It will receive more wear and tear than most furniture in one's home. (See Figure 11-10).



Figure 11-10. Liability abounds for aesthetics by leaving a broken piece of furniture where it could be used. The sign says, "Couch Is Broken, Please Do Not Sit On It."

You should be aware of the following aspects regarding furniture:

- Does it meet strength requirements?
- Are there sharp corners, glass tops, or protruding parts that create hazards?
- Are chairs designed for their intended purpose, e.g., desk chairs, meeting room chairs, computer workstation chairs? For example computer workstation chairs should have five legs to help prevent upsets.
- Are shelves and file cabinets stable for the loads?
- Is the furniture comfortable since workers will be using it daily? It should not facilitate possible stress-related injuries such as repetitive motion injuries.
- Do all moving parts of furniture move free without binding?
- Is all furniture functional in this office environment?

CONTRACTOR SAFETY

A part of designing for safety and health is the hiring of contractors to complete work or to provide a service regarding your office building. This process should

not be viewed as easy or unrelated to safety and health. Far from this, safety and health are equally as important as is the contractor's skill to do the work for which you are contracting.

Pre-qualification

It is very necessary to pre-qualify all potential contractors who have submitted a bid to do your scope of work. You must determine if the contractor can carry out the job safely. This is done by evaluating the contractor's performance and competency. Some of the criteria to consider are:

- What is the nature of the work (location, type of activity, time scale for completion, number of contractors on the site, etc.)?
- What financial costs are involved?
- What hazards are currently identified on the site or may be introduced during the project?
- Are there existing drawings and what relevant information do they show?
- Are there site-wide factors to be considered (site access and exit, loading/unloading areas, exclusion of pedestrians, or specific rules of operation from yourself)?

During this pre-qualification process, it is important to determine the performance record of the contractor and the use of best-management practices. As a part of performance, safety and health performance should be evaluated. Some of the factors to take into consideration are:

- Is the contractor's experience modification rate (EMR) for workers' compensation equal to or less than 1? You should hire no contractor with an EMR above 1.
- Request a history of the contractor OSHA recordable cases.
- Request or obtain from the OSHA website a history of the contractor's OSHA violations.
- Compare the contractor's incident rate with that from the BLS for his SIC code.

Some questions that you should have answered are:

- Does the contractor have a written safety and health program?
- Has the contractor implemented his or her safety and health program?
- Is the contractor senior management committed to the safety and health initiative?
- Has the contractor assigned a particular person the responsibility for safety and health on the job or project sites?
- Are supervisors held financially accountable for safety and health of their crews?
- Are safety and health visible and an integral part of the contractor's other projects?

- Are all the contractor's employees trained in safety and health and the expected job hazards? Is this training documented?
- Does the contractor work to improve safety and health on his or her jobsite?

Contractor-Management Responsibilities

Specifically for construction activities the following regulations state rather clearly what the contractor's responsibility is regarding safety and health on the jobsite:

- 29 CFR 1926.16(a), OSHA regulation states, "In no case shall the prime contractor be relieved of overall responsibility for compliance with the requirements of this part for all work to be performed under the contract."
- 29 CFR 1926.16(c), OSHA regulations further state, "With respect to subcontractor work, the prime contractor and any subcontractors shall be deemed to have joint responsibility."
- 29 CFR 1926.16(d), "Where joint responsibility exists both the prime contractor and his subcontractor or subcontractors, regardless of their tier, shall be considered subject to the enforcement of provisions of the OSHAct."

Training

Safety and health training is one way of trying to ensure that workers and their supervisors are cognizant of safety and health expectations as well as the site-specific hazards involved in your office building.

- Contractors have the responsibility to ensure that all employees are properly trained.
- Safety orientation should include a review of:
 - Physical and chemical hazards on site (fire, explosion, and toxic release type hazards).
 - General safety rules and regulations.
 - Work permit procedures.
 - Other day-to-day issues.
- Training will raise the level of safety awareness.

Other Steps to Ensure Safety and Health

It is essential to prevent and reduce injuries and illnesses and maintain a safe work environment for workers of contractors. Relevant to safety and health, everything that is done should be designed to protect employees, company's facilities, and the local community. You should make sure that the following are accomplished in order to preserve the safety and health in contract-related work. Some of what you might undertake are:

- Conduct a pre-entry briefing prior to site entry and at other times, as necessary, to ensure employees are aware of site hazards.

- Job hazard analysis techniques can be used to develop project or job specification and procedures by:
 - Reviewing the scope of work.
 - Identifying and evaluating controls for reducing hazards.
 - Reviewing hazards of each task such as:
 - Biological hazards.
 - Fall hazards.
 - Electrical hazards.
 - Overhead/underground utilities.
 - Heavy equipment.
 - Lockout/tagout.
 - Chemical hazards.
 - Permit-required confined space.
 - Barricading and fencing.
 - Asbestos and lead.
 - Hot work permits.
 - Scaffolding and ladder hazards.
 - Trenching and excavations.
- Periodic safety inspections and the correction of any deficiencies.
- Documentation of the planned work should be maintained at the workplace.
- Any changes should be documented, reviewed and updated as necessary.

The Agreement

As a part of the contract, you should include a safety and health agreement. As part of this agreement, you should include:

- Details of the responsibilities of the contractor and yourself regarding safety and health.
- Contractor's proof of an existing and functional safety and health program.
- Details of any specific hazards that may be relevant to the contract work and provided to the contractor.
- The contractor should provide details of any hazards that it will bring onto the site or workplace or any hazard that may be created as a result of the nature of the work undertaken and the safety guards that will be imposed to mitigate the hazard to the greatest extent possible.
- Assurance that the contractor's employees have received the safety training required for the specific job.
- Emergency and personal protective equipment is available by the contractor.

- The contractor will be advised on miscellaneous matters, such as how to activate the fire alarm, the location of fire extinguishers and first aid assistance, escape possibilities, and where and to whom the contractor should report in case of an emergency situation.
- Strategies for communicating issues related to safety and health (e.g., site meetings)

Evaluation

You must develop guidelines for contractors. These include your policies and procedures as well as contractor safety rules and procedures regarding safety and health. You must learn about mistakes and near misses as part of the learning and prevention process. You must measure and monitor the contractor's safety and health performance.

This is accomplished by tracking accidents, incidents, equipment damage, recordable injuries or illnesses and even first aid cases. Conduct surprise inspections to determine the contractor's attitude towards job safety and his or her desires to improve performance. It is important to develop a measurement of safety and health performance.

Contractors must have an on-site project manager or supervisor for essential smooth and efficient operation. Contractors and their managers must share the overall responsibility and liability. Contractors and their managers must be professional and able to interpret and manage safety programs, solve problems efficiently and expediently. Contractors and their managers must have or develop the skill to handle legal, financial, and customer relations. A contractor's safety program is a catalyst for reducing accidents. You should not accept a minimal or "paper" safety program. You want contractors to commit to excellence in safety and quality practices. Without safety you can expect poor quality and this poor quality leads to increased production cost and poor employee morale. Contractor safety and health performance is the key to getting what you are paying for.

SUMMARY

So many factors go into designing for safety and health in an office environment. You have probably thought of others as you have read this chapter. You should keep a list of other items and areas that you think deserve consideration in designing safe and healthy office building. Since each office building is a unique workplace, you will find that some of the issues in this chapter apply while other may not when designing your office building and office work environments.

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CHAPTER 12

OFFICE ERGONOMICS



This work environment seems to be designed for the workers in it. It is well lit, neat, and appears comfortable.

Office ergonomics is often thought of as designing computer workstations. But ergonomics is the designing of the entire office-building environment to fit the workers with it. It encompasses not only the design of a workstation, but the total environment, which is temperature, air quality, humidity, color, lighting, noise, information transfer, adequacy of the amount of work area, and the ambiance in the workplace. The purpose of ergonomics is to provide a total workplace that can be as productive as possible and yet address all the potential hazards that could affect the safety, health and well-being of an office worker.

WORKSTATION ERGONOMICS

Ergonomics means fitting the workplace to the workers by modifying or redesigning the job, workstation, tool or environment. Workstation design can have a

big impact on office workers' health and well-being. There are a multitude of discomforts that can result from ergonomically incorrect computer workstation setups. The most common complaints relate to the neck, shoulders, and back.

Applying Good Work Practices

The way a task is performed and the workstation environment in which it is performed can influence the risk of injury and general work productivity. Good techniques can make a job easy and safe to accomplish. Some suggestions are:

- Adjusting the drapes or blinds.
- Moving the monitor away from sources of glare or direct light.
- Tipping the monitor slightly downward.
- Using diffusers on overhead lighting.
- Placing an anti-glare filter on the screen.
- Cleaning the monitor screen on a regular basis.
- Avoiding cradling the telephone between the head and shoulder. Hold the phone with your hand, use the speaker phone, or a headset.
- Keeping frequently used items such as the telephone, reference materials, and pens/pencils within easy reach.
- Positioning the monitor directly in front of the user.
- Moving between different postures regularly.
- Applying task lighting as to your needs.
- Using the minimum force necessary to strike the keyboard/ten-key keys.
- Using the minimum force necessary to activate the hole punch and stapler.
- Varying your tasks to avoid a long period of one activity.
- Taking mini-breaks to rest the eyes and muscles. A break does not have to be a stop of work duties. However, it should be a different style of physical activity such as changing from keyboarding to using the telephone or filing.
- Neutralizing distracting noise by using earplugs, playing soft music, or turning on a fan.
- Maintaining a comfortable workplace temperature by using layers of clothing or a fan.

COMPUTER WORKSTATIONS

Complaints concerning musculoskeletal problems are frequently heard from

computer operators. Most common are complaints relating to the neck, shoulders, and back. Others concern the arms and hands and occasionally the legs.

Certain common characteristics of VDT jobs have been identified and associated with increased risk of musculoskeletal problems. These include:

- Design of the workstation.
- Nature of the task.
- Repetitiveness of the job.
- Degree of postural constraint.
- Work pace.
- Work/rest schedules.
- Personal attributes of individual workers.

The key to comfort is in maintaining the body in a relaxed, natural position. The ideal work position is to have the arms hanging relaxed from the shoulders. If a keyboard is used, arms should be bent at right angles at the elbow, with the hands held in a straight line with forearms and elbows close to the body. The head should be in line with the body and slightly forward. More specifics on VDTs are found in the following subsections.

Display Screens

When work is conducted at a computer, the top of the display screen should be at, or just slightly below, eye level. This allows the eyes to view the screen at a comfortable level, without having to tilt the head or move the back muscles.

Control glare at the source whenever possible; place VDTs so that they are parallel to direct sources of light such as windows and overhead lights, and use window treatments if necessary. When glare sources cannot be removed, seek appropriate screen treatments such as glare filters. Keep the screen clean.

Video Display Terminals

Video Display Terminals (VDTs) are now prevalent in all types of offices. It is common to see operators working with a VDT without interruption for several hours or an entire day.

VDT work restricts movement, demands that the hands be kept positioned at the keyboard, and requires constant attention to the monitor. Operators become susceptible to the effects of poor posture, awkward wrist positioning, poor lighting, and inadequate display characteristics. It is critical that VDTs be designed to fit the capabilities and physical limitations of the worker.

VDT Workstation Design

Studies of individuals engaged in long-term sitting indicate that people usually do not sit straight but continually shift their position. Proper back support and a large working area contribute to comfortable sitting. Therefore, the furniture in a VDT workstation should be as accommodating as possible.

A properly designed chair for the VDT operator is an essential part of the

workstation. It affects posture, circulation, and pressure on the spine. A good backrest is an important feature of the chair. It should adjust up, down, backward, and forward. The backrest also supports the inward curve of the lower spine (lumbar). Ideally, the angle between the trunk and thighs should be greater than 90 degrees.

The seat surface should be a reasonable composition so that operators do not suffer pressure from a hard seat or experience over-elevation from a soft seat. Chair stability and mobility are critical for ease of movement while in the chair. Chair adjustments must be simple or the operator will not bother to adjust the chair.

The height of the seat pan should be adjustable so that a seated operator's feet are firmly rested on the floor. The operator's thighs should be somewhat horizontal and the lower legs should be vertical. A footrest may be needed to reach a comfortable sitting position.

Video Display Terminal Areas of Adjustability

The keyboard should be detachable from the VDT to permit the operator to locate it for convenience and preference, according to the work to be performed. Palm, hand, wrist, and arm supports may be needed for long-term keying. A desk height of 24 to 28 inches will allow the upper and lower forearms to form an angle of approximately 90 degrees. The upper arms should hang comfortably at the sides.

The monitor should be located at a proper distance and angle with respect to the human eye. A viewing distance of 12 to 14 inches (30 to 35 centimeters) is common for many operators. A line of sight 10 degrees or more below the horizontal is a comfortable eye position. The monitor should be angled so that the normal vision line falls in the upper half of the screen (see Figure 12-1).

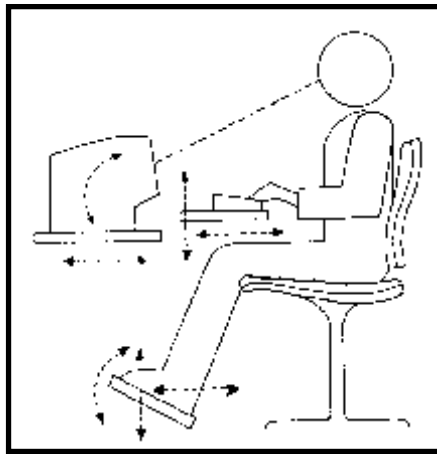


Figure 12-1. Computer workstation adjustability. (Courtesy of the North Carolina Department of Labor.)

Workstation Illumination

The amount of light on a VDT workstation determines if the surface of the display receives direct reflections. Screen reflections may be annoying and cause operator complaints. Reflections on the screen can come from overhead light sources, light fixtures, windows, and shiny surfaces.

In the past, higher levels of illumination were considered more effective. Present recommendations on luminance are that there should be no more than a 3:1 ratio in luminance between the task area and its surroundings. The contrast between the task and the background allows for easy viewing.

Headaches and eye fatigue due to reflected illumination can be reduced in several ways. The most effective method of minimizing screen reflections is to eliminate the light source. This can be accomplished by moving the light source or workstation or by using indirect illumination. If natural lighting is a problem, it is best to position the display so that it is perpendicular to windows.

The next best solution for glare reduction is to control the light between the source and the screen. Baffles, louvers, shades, and shields are useful light control devices.

The least desirable solution is to control the light at the screen of the display. Surface treatments or filters can be used. Filters are designed to improve contrast and reduce glare. However, the overall energy from the VDT character is lessened by a filter and character sharpness is reduced.

Work Methods

Even a comfortable workstation can be stressful and tiring after an operator sits for long periods of time. Stretching occasionally, looking away from the work, or getting up from the VDT station can help relieve strain and stress. If other tasks can be accomplished, alternating them with VDT work can vary the work rhythm to reduce strain and tension.

The Chair

The chair is usually the most important piece of furniture that affects user comfort in the office. The chair should be adjusted for comfort, making sure the back is supported and that the seat pan is at a height so that the thighs are horizontal and feet are flat on the floor. All office chairs should have five legs for support. An ergonomically sound chair requires four degrees of freedom—seat pan tilt, backrest angle, seat height, and backrest height. Operators can then vary the chair adjustments according to the task. In general, chairs with the most easily adjustable dimensions permit the most flexibility to support people's preferred sitting postures.

Armrests on chairs are recommended for most office work except where they interfere with the task. Resting arms on armrests is a very effective way to reduce arm discomforts. Armrests should be sufficiently short and low to allow workers to get close enough to their work surfaces, especially for tasks that require fixed arm postures above the work surface (see Figure 12-2).



Figure 12-2. A fully adjustable work chair.

Working Height

The work surface height should fit the task. The principle is to place the surface height where the work may be performed in such a manner as to keep arms low and close to the body in relation to the task. If the working height is too high, the shoulders or the upper arms have to be lifted to compensate, which may lead to painful symptoms and cramps at the level of the neck and shoulders. If, on the other hand, the working height is too low, the back must be excessively bowed, which may cause backache. Generally, work should be done at about elbow height, whether sitting or standing. Adjustable workstations should be provided so that individuals may change the stations to meet their needs. A VDT workstation without an adjustable keyboard height and without an adjustable height and distance of the screen is not suitable for continuous work.

Work/Rest Schedules

One solution for stress and fatigue is to design the computer operator's work so that tasks requiring concentrated work at the terminal are alternated with non-computer based tasks throughout the workday. Also, a short break (5–10 minutes) should be taken at least once each hour when involved in continuous work at the computer.

Other Solutions

Additional measures that will aid in reducing discomfort while working with VDTs include:

- Changing position, standing up, or stretching whenever you start to feel tired.
- Using a soft touch on the keyboard and keeping your shoulders, hands, and fingers relaxed.
- Using a document holder, positioned at about the same plane and distance as the display screen.
- Resting the eyes by occasionally looking off into the distance.

OFFICE LIGHTING

Different tasks require different levels of lighting. Areas in which intricate work is performed, for example, require greater illumination than warehouses. Lighting needs vary from time-to-time and person-to-person as well. One approach is to use adjustable task lighting that can provide needed illumination without increasing general lighting. Task lamps are very effective to supplement the general office light levels for those who require or prefer additional light. Some task lamps permit several light levels. Since the individual controls task lamps, they can accommodate personal preferences.

Lighting is one of the most important factors affecting personal comfort on the job. The best lighting system is one in which the light level is geared to the task, where brightness ratios are controlled (no intensely bright or dark areas in one field of vision) and where ceilings, walls, and floors are carefully chosen to minimize glare. Glare is defined as a harsh, uncomfortable bright light that shines directly in the eyes. Glare may be either direct, coming from lights or sunshine, or indirect, coming from a reflected surface.

Vision problems are one of the leading sources of complaints among office workers. Poor office lighting can cause eyestrain and irritation, fatigue, double vision, watering and reddening of the eyelids, and a decrease in the power of focus and visual acuity. Headaches as well as neck and back pains may occur as a result of workers straining to see small or detailed items. Poor lighting in the workplace is also associated with an increase in accidents. Direct and reflected glare and shadows as well as delayed eye adaptation when moving from bright surroundings into dark ones (or vice versa) may prevent an employee from seeing and lead to tripping and other similar hazards.

There are a number of measures that can be used to prevent and control poor lighting conditions in the work environment:

- Regular maintenance of the lighting system should be carried out to clean or replace old bulbs and faulty lamp circuits.
- A light-colored matte finish on walls, ceilings, and floors to reduce glare is recommended by the Illuminating Engineering Society.
- Whenever possible, office workers should not face windows, unshielded lamps, or other sources of glare.
- Adjustable shades should be used if workers face a window.
- Diffused light will help reduce shadows. Indirect lighting and task lighting are recommended, especially when work spaces are separated by dividers.
- Task lamps are very effective in supplementing general office lighting for those who require or prefer additional lighting. Some task lamps permit several light levels.

COLOR

Color in the workplace seems to have a psychological effect on individuals due to optical illusions and emotional experiences that colors trigger. Such emotional experiences may be positive or negative since colors tend to link with earlier experiences that workers have had.

Generally, dark colors are depressing and tiring while light colors are friendly and cheerful. Room colors must also be considered in light of the nature of the work to be accomplished. Routine work requires more exciting colors. Work requiring close concentration requires colors that are not distracting but are restful.

Intense colors should be reserved for rooms such as entrance halls, restrooms and corridors. Strong colors may help brighten these areas, making them more cheerful. Particular colors and their effects are summarized below in Table 12-1.

Table 12-1	
Color and Its Effects on Workers	
<u>Colors</u>	<u>Effects</u>
Blue	Restful
Brown	Restful
Green	Very restful
Orange	Exciting
Yellow	Exciting
Red	Very stimulating, not restful
Violet	Aggressive, tiring

OFFICE NOISE

Noise can be defined very simply as unwanted sound. Office workers are subjected to many noise sources including video display terminals, high-speed printers, telephones, fax machines, and human voices. Noise can produce tension and stress as well as damage to hearing at high noise levels. For noise levels in offices, the most common effects are interference with speech communication, annoyance, and distraction from mental activities. The annoying effect of noise can decrease performance or increase errors in some task situations. If the tasks require a great deal of mental concentration, noise can be detrimental to performance.

Government standards have set limits for exposure to noise to prevent hearing loss in employees. The level of noise one can safely be exposed to is dependent on the intensity of the noise as well as the duration of exposure. In an office setting OSHA noise standards are rarely approached or exceeded. However, problems could arise in areas with a high concentration of noisy machines, such as high-speed printers or copy machines.

When employees are subjected to sound levels exceeding OSHA standards, feasible administrative or engineering controls must be utilized. If such controls fail to reduce sound levels, personal protective equipment must be provided and used to reduce sound levels.

For many of the annoying sounds in the office environment, the following measures are useful for reducing the level of noise or its effects:

- Select the quietest equipment if possible. When there is a choice between two or more products, sound levels should be included as a consideration for purchase and use.

- Provide for proper maintenance of equipment, such as lubrication and tightening of loose parts that can cause noise.
- Locate loud equipment in areas where its effects are less detrimental. For example, place impact printers away from areas where people must use the phone.
- Use barrier walls or dividers to isolate noise sources. Use of buffers or acoustically treated materials can absorb noise that might otherwise travel further. Rubber pads to insulate vibrating equipment can also help to reduce noise.
- Enclose equipment, such as printers, with acoustical covers or housings.
- Schedule noisy tasks at times when they will have less of an effect on the other tasks in the office.

Noise's Effect

Noise in the office can interfere with communications. For example, it may be difficult to talk on the telephone when other people are talking nearby. Speech is likely to interfere with communications especially if the speakers have similar voices.

The annoying effect of noise can decrease performance or increase errors in some task situations. If the task requires a great deal of mental concentration, noise can be detrimental to performance. Also, there is some indication that unexpected or unpredictable noise can have more of an effect than continuous or periodic noise. The annoyance caused by noise also depends on the individual. Noise can also be distracting. A sudden noise can interrupt activity temporarily, such as when someone drops a heavy object.

ENVIRONMENTAL PARAMETERS

A ventilation system should provide for a comfortable environment with respect to humidity and temperature. The overall goal of climate control is to provide an environment that is not too cold, hot, dry or humid, and that is free from drafts and odors. Humidity refers to the amount of moisture in the air and extremes in humidification levels can influence how comfortable you may be. When the air is too humid, it makes people feel uncomfortable (wet, clammy) and can promote mold growth. On the other hand, low humidity conditions (which typically occur in the winter months) dry out the nasal and respiratory passages. Low humidity may be associated with an increased susceptibility to upper respiratory infections. Static electricity problems (affecting hair and clothes, particularly synthetic fibers) are good indicators of an office with low relative humidity.

Excessively high or low temperatures in an office area can also lead to symptoms in building occupants and reduce productivity. High temperatures have been associated with fatigue, lassitude, irritability, headache and decrease in performance, coordination and alertness. A number of factors interact to determine whether people are comfortable with the temperature of the indoor air. The activity level, age, and physiology of each person affect the thermal comfort requirements of that individual. Extreme heat, which is unlikely to be found in an office environment, can result in

heat rash, exhaustion, and fainting. Workers who may be less alert or fatigued from a high temperature environment may be more prone to accidents. Likewise, if the environment is too cold, flexibility, dexterity, and judgment may be impaired and therefore accidents may increase.

The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) has published guidelines for maintaining comfortable and productive work environments. According to ASHRAE, these temperature ranges represent the environmental conditions which 80% of the building occupants consider comfortable. ASHRAE recommends the following temperature and humidity ranges for office work (see Table 12-2):

Table 12-2		
Temperature and Humidity Ranges for Offices		
Relative Humidity	Winter Temperature Range	Summer Temperature Range
30%	68.5–76.0 F	74.0–80.0 F
40%	68.5–75.5 F	73.5–79.5 F
50%	68.5– 74.5 F	73.0– 79.0 F
60%	68.0–74.0 F	72.5–78.0 F

Note: Relative humidity above 50% is not recommended because it can promote mold growth.

Temperature

Indoor climate conditions are among the most common complaints from office workers. An uncomfortable atmosphere can cause annoyance and even pain, depending on the degree of heat imbalance.

The effects of improper temperature include fatigue, sweating, respiratory discomfort, and changes in pulse rate. Too warm of an atmosphere leads to sleepiness, a decrease in performance, and increased chance for errors. An atmosphere which is too cool stimulates restlessness and reduces alertness and concentration.

Because productivity is related to a comfortable climate, it is important to keep the office at a pleasing temperature. Of course, individuals perceive temperature comfort levels differently. Recognizing that fact, the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) developed a voluntary standard (ASHRAE 55-1981) for temperature ranges. Compliance with the standard would yield temperatures satisfactory to 80 percent of the average population. Compliance would require:

- A range of 73° to 79°F for an average individual in the summer, and a range of 68° to 74.5°F in the winter.

- A relative humidity between 30 and 60 percent.
- An average indoor air velocity of 0.25 meters per second or less in the summer, and an average indoor air velocity of 0.15 meters per second or less in the winter.

Preferred air temperature may vary according to air velocity, clothing, muscular activity, and metabolism. Situational conditions can also affect comfort levels. Sitting near a glass wall or window on a hot or cold day may be uncomfortable, and sitting near heat-producing equipment such as VDTs and copiers may cause discomfort.

Humidity

Office humidity deficiencies can lead to adverse health effects. It has been demonstrated that dry air leads to chronic irritation of the nasal and bronchial passages. Studies have shown that dry mucous membranes in the air ducts can obstruct the flow of mucous over the ciliary tracts, possibly leading to diminished infection resistance.

Relative humidity below 30 percent is thought to create unhygienic conditions. Atmospheric humidity does not measurably affect thermal comfort, or the effective temperature, if the temperature and humidity are within the ranges recommended by ASHRAE.

PREVENTING STRESS

To reduce stress and prevent fatigue, it is important to take mini-breaks (not many breaks) throughout the day. If possible, change tasks at least once every two hours. Stretch your arms, neck, and legs often if you do the same type of work for long periods of time. Rest your eyes often by closing them or looking at something other than the work at hand. For a quick pick-me-up, breathe deeply several times by inhaling through your nose and exhaling through your mouth. In addition, always try to eat your lunch somewhere other than your desk.

Other examples of stress-relieving exercises that can be done at your desk include the following:

- **Head and Neck Stretch:** Slowly turn your head to the left, and hold it for three seconds. Slowly turn your head to the right, and hold it for three seconds. Drop your chin gently towards your chest, and then tilt it back as far as you can. Repeat these steps five to ten times.
- **Shoulder Roll:** Roll your shoulders forward and then backward using a circular motion.
- **Upper Back Stretch:** Grasp one arm below the elbow and pull gently towards the other shoulder. Hold this position for five seconds and then repeat with the other arm.
- **Wrist Wave:** With your arms extended in front of you, raise and lower your hands several times.
- **Finger Stretch:** Make fists with your hands and hold tight for one second, then spread your fingers wide for five seconds.

SUMMARY

Office ergonomics should be a total approach to the office work environments that considers not only the worker’s workstation, but the comfort factors (e.g., temperature). It should take into consideration the individual differences between workers and this is why having adjustable workstations is so important. Workers in an office situation must be able to adjust their work areas to meet their physical and psychological needs. Quite often this work is very stressful and confining which leads to workers feel imprisoned in their work areas. In order to help mitigate this situation, it is beneficial to audit the workstation and job task of individual workers. The checklist found in Figure 12-3 can be used for this purpose or modified to meet your needs.

ERGONOMIC CHECKLIST FOR AN OFFICE WORKSTATION

The checklist is provided to assist in the assessment of VDT workstations of people reporting discomfort at work. The checklist can be used by supervisors and occupational health and safety personnel and will assist in the identification of problems associated with individual workstations. The problems identified through the checklist should be brought to the attention of management so that appropriate action can be taken.

Date: _____

VDT User: _____

Assessor: _____

Problems Identified: _____

Work Organization

- ☐ Yes ☐ No Does the user have a variety of tasks?
- ☐ Yes ☐ No Does the user have some control over the order in which they are done?
- ☐ Yes ☐ No Is care taken to avoid placing the user under pressure to meet demanding work targets or deadlines?
- ☐ Yes ☐ No Has there been a constancy in workload recently? (This is preferable to sudden increases in workload/or working overtime.)
- ☐ Yes ☐ No If the user is a new staff member, or has recently returned from leave, did he/she have a period to adjust to the workload?
- ☐ Yes ☐ No Have work pauses been taken as appropriate?

Workstation Adjustment

Chair

- ☐ Yes ☐ No Is the chair easily adjusted from a seated position?
- ☐ Yes ☐ No Can the user get close to the workstation without impediment? (Check that the desktop is thin.)
- ☐ Yes ☐ No Is the seat height adjusted so that the user's thighs are parallel to the floor with feet resting on the floor or on a footrest? (Chair arms are not in the way and there is clear leg room.)
- ☐ Yes ☐ No Is the backrest height adjusted to fit into the small of the user's back and adequately support the spine? (To find the small of the back, have the user stand with hands on waist.)
- ☐ Yes ☐ No Is the backrest angle adjusted so that the user is sitting upright while keying? (User should be encouraged to change backrest position when not keying.)

Desk

- ☐ Yes ☐ No Are the user's forearms parallel with the floor or angled slightly downward? (This can be achieved by lowering the desk to suit the user, or, with a fixed-height desk, raising the chair.)
- ☐ Yes ☐ No Is the desk height adjustable?
- ☐ Yes ☐ No If YES, is the adjustment easily operated?
- ☐ Yes ☐ No If NO, has the user been provided with a footrest?

Footrest

- ☐ Yes ☐ No Is the footrest large enough to support both feet and allow a change of position?

Counter

- ☐ Yes ☐ No Are chairs of appropriate height and footrest provided at the counter where sitting/standing work is performed?

Documents

- ☐ Yes ☐ No Are all source documents legible?
- ☐ Yes ☐ No Is a document holder provided?
- ☐ Yes ☐ No Does it support all source documents adequately?
- ☐ Yes ☐ No Can documents be manipulated easily as required?

Screen

- ☐ Yes ☐ No When sitting tall and looking straight ahead, is the user looking at the top edge of the screen?

- ☐ Yes ☐ No Is the screen at a comfortable reading distance?
- ☐ Yes ☐ No Are all characters in the display easily legible and is the image stable?
- ☐ Yes ☐ No Can the position and contrast of the screen be adjusted by the user?

Keyboard

- ☐ Yes ☐ No Is the keyboard detached from the screen to ensure a comfortable working position?
- ☐ Yes ☐ No Is the keyboard thin enough for comfortable positioning of the arms? (It should be less than 1 1/4 inches thick at the home row of keys.)
- ☐ Yes ☐ No Is the keyboard matt finished to prevent irritation from glare and reflection?

Layout

- ☐ Yes ☐ No Are all often-used items within easy reach? (They should be within normal arm reach with minimum trunk movement.)
- ☐ Yes ☐ No Is there sufficient space for large documents, completed work or writing?
- ☐ Yes ☐ No Is there sufficient space for computer furniture, equipment and hard copy materials?
- ☐ Yes ☐ No Is the workstation designed to prevent undue twisting of the neck or trunk?
- ☐ Yes ☐ No Are the variety of tasks performed in counter operations accommodated by the design and layout of the counter workstation?

Environment

- ☐ Yes ☐ No Does the user find the lighting satisfactory? (Ask about glare, reflection and the ability to read documents.)
- ☐ Yes ☐ No Does the user find the noise level conducive to concentration?
- ☐ Yes ☐ No Does the user find the temperature and airflow in the room comfortable?

Telephone Operations and Headsets

- ☐ Yes ☐ No Is there a headset available for continuous telephone operations?
- ☐ Yes ☐ No Is the headset lightweight, adjustable and comfortable?
- ☐ Yes ☐ No Does the telephone equipment include easily adjustable volume controls?
- ☐ Yes ☐ No For telephone operations that are traffic dependent and continuous, is a manual call control facility provided?

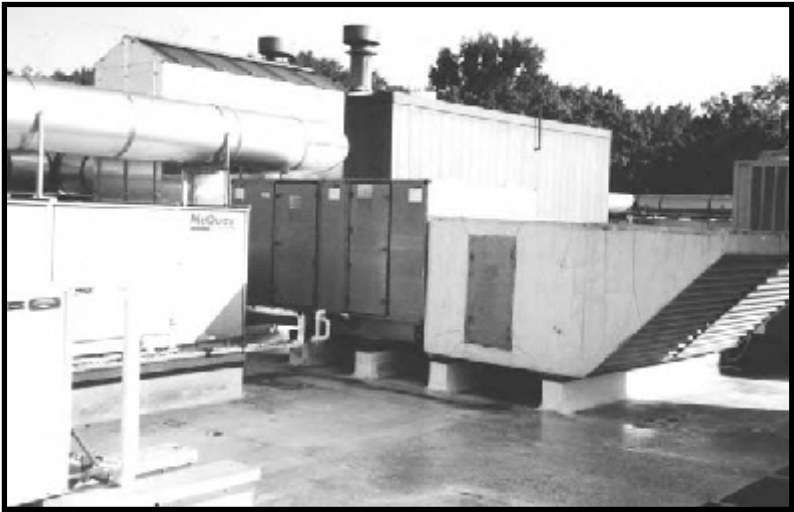
Figure 12-3. Ergonomic checklist for an office workstation.

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CHAPTER 13

OFFICE BUILDING ENVIRONMENT



Heating, ventilation and air conditioning (HVAC) units on the top of an office building.

INDOOR AIR QUALITY

Our awareness of the quality of indoor air has increased in recent years. Energy conservation programs spawned by world oil shortages have resulted in building design and operation changes. Buildings have been sealed and ventilation rates reduced to prevent the infiltration of untempered outside air (hot, humid air in the summer months and cold, dry air in the winter). These changes have conserved fossil fuels and operating costs, but they have also negatively affected indoor air quality.

Indoor air quality (IAQ) is an increasingly important issue in the work environment. The study of indoor air quality and pollutant levels within office environments is a complex problem. The complexity of studying and measuring the quality of office environments arises from various factors including:

- Office building floor plans are frequently changing to accommodate increasingly more employees and reorganization.
- Office buildings frequently undergo building renovations such as installation of new carpet, modular office partitions and freestanding offices, and painting.
- Many of the health symptoms appearing are vague and common both to the office and home environments.
- In general, very little data on pollutant levels within office environments is available.
- Guidelines or standards for permissible personal exposure limits to pollutants within office buildings are very limited.

Many times odors are associated with chemical contaminants from inside or outside the office space or from the building fabric. This is particularly noticeable following building renovation or installation of new carpeting. Out-gassing from such things as paints, adhesives, sealants, office furniture, carpeting, and vinyl wall coverings is the source of a variety of irritant compounds. In most cases, these chemical contaminants can be measured at levels above ambient (normal background) but far below any existing occupational evaluation criteria.

Because the building is somewhat of a closed system with numerous semi-closed off areas, it takes longer for smells to dissipate than in a factory with higher ceilings or workplaces with natural ventilation.

OVERVIEW OF VENTILATION DESIGN

Air enters office buildings or spaces through both mechanical ventilation systems as well as naturally through leaks around windows, doors, etc. Newer, larger buildings which are highly energy efficient due to sealed windows and heavy insulation primarily depend on mechanical ventilation. Older, small, and low occupancy office buildings can be adequately ventilated through natural sources which include air leakage through opened windows and doors, as well as through cracks in the windows and walls, and other openings.

In a modern office building, the heating ventilation and air conditioning system (HVAC) is designed to keep occupants comfortable and healthy by controlling the amount of outside air that is added to the building atmosphere, filtering both incoming and recirculated air to remove particulates and controlling the temperature. The HVAC system includes all heating, cooling, and ventilation equipment serving a building: furnaces or boilers, chillers, cooling towers, air handling units, exhaust fans, ductwork, filters, steam (or heating water) piping (see Figure 13-1).

A ventilation system consists of a blower to move the air, ductwork to deliver air to the room, and vents to distribute the air. A good ventilation design will distribute supply air uniformly to each area and especially areas with office machines. An effectively designed area will not have the supply and exhaust vent too close together because fresh air may be removed before it is adequately distributed throughout the area. Exhaust fans are often located a significant distance away from supply vents. A simple way to determine if the ventilation system is running or if a vent is a supply or exhaust is by holding a tissue near the vent and note its movement or lack



Figure 13-1. A typical HVAC system on the top of a building with cooling towers and discharge stacks.

thereof. If the tissue moves, the air is being circulated and the direction the tissue is blown will determine the type of vent.

The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) has established a general guideline of 20 cubic feet of outside air per minute/per person for an office environment. This is a sufficient amount of air to dilute building contaminants and maintain a healthy environment. Indoor air quality complaints increase significantly in offices that are not supplied sufficient outside air.

INDOOR AIR POLLUTION

An inadequately ventilated office environment or a poorly designed ventilation system can lead to the buildup of a variety of indoor air pollutants. Air pollutants can originate within the building or be drawn in from outdoors. Examples of sources that originate outside a building include: (1) pollen, dust and fungal spores; (2) general vehicle exhaust; (3) odors from dumpsters; and (4) re-entrained exhaust from the building itself or from neighboring buildings. Examples of sources that originate from within the building include: (1) building components and furnishings; (2) smoking; (3) maintenance or remodeling activities (painting, etc.); (4) housekeeping activities; (5) unsanitary conditions (standing water from clogged drains or dry traps) and water damage; and (6) emissions from office equipment or special use areas (print shops, laboratories, or food preparation areas).

CONTROLS TO PREVENT INDOOR AIR POLLUTION

The following recommendations and guidelines are useful in preventing indoor air quality problems:

- HVAC systems should receive periodic cleaning and filters should be changed on a regular basis on all ventilation systems.

- The ventilation system should introduce an adequate supply of fresh outside air into the office and capture and vent point air pollutant sources to the outside.
- Office machinery should be operated in well-ventilated areas. Most office machinery does not require local exhaust ventilation in areas that are already provided with 7–10 air changes per hour. Photocopiers should be placed away from workers' desks. Workers should vary work tasks to avoid using office machines excessively.
- Office equipment should be cleaned/maintained according to the manufacturer's recommendations. Properly maintained equipment will not generate unhealthy levels of pollutants.
- Special attention should be given to special operations that may generate air contaminants (such as painting, pesticide spraying, and heavy cleaning). Provisions for adequate ventilation must be made during these operations or other procedures, such as performing work off-hours or removing employees from the immediate area.

Modern office buildings are generally considered safe and healthful working environments. However, energy conservation measures instituted during the early 1970's have minimized the infiltration of outside air and contributed to the buildup of indoor air contaminants. Investigations of indoor air quality (IAQ) often fail to identify any harmful levels of specific toxic substances. Often employee complaints result from items such as cigarette smoke, odors, low-level contaminants, poor air circulation, thermal gradients, humidity, job pressures, lighting, workstation design, or noise.

SOURCES OF INDOOR AIR POLLUTION

Indoor air quality is affected by pollution from inside and outside of buildings and from poor ventilation. Human metabolic activity, smoking, structural components of the building, building contents, biological contamination, office and mechanical equipment, and outside air pollutants that enter the building—all are sources of indoor air pollution.

NIOSH has conducted hundreds of building studies that indicate that the most likely sources of this problem are poor ventilation, poor thermal conditions, too high or low humidity, emissions from office machines, copiers and other building contaminants and poor ergonomic layout of workstations.

The range of investigations of indoor air quality problems encompasses complaints from one or two employees to episodes where entire facilities are shut down and evacuated until the events are investigated and problems corrected.

Complaints are often of a subjective, nonspecific nature and are associated with periods of occupancy. These symptoms often disappear when the employee leaves the workplace. They include headache, dizziness, nausea, tiredness, lack of concentration, and eye, nose, and throat irritation.

In approximately 500 indoor air quality investigations in the last decade, NIOSH found that the primary sources of indoor air quality problems are:

- Inadequate ventilation—52 percent.
- Contamination from inside building—16 percent.

- Contamination from outside building—10 percent.
- Microbial contamination—5 percent.
- Contamination from building fabric—4 percent.
- Unknown sources—13 percent.

Inside Air Contaminants

According to NIOSH, approximately four percent of indoor air problems can be attributed to contamination from building materials and products. Formaldehyde can emit vapors from urea-formaldehyde foam insulation, particleboard, plywood, and some glues and adhesives commonly used during construction. Other contaminants include fibrous glass, various organic solvents from glues and adhesives, and acetic acid used as a curing agent in silicone caulking.

Chemicals from copying machines, for example, methyl alcohol from spirit duplicators, butyl methacrylate from signature machines, and ammonia and acetic acid from blueprint copiers, contribute to indoor air pollution. Other inside contaminants include:

- Improperly applied pesticides.
- Boiler additives such as *n,n*-diethylethanolamine.
- Improperly diluted cleaning agents such as rug shampoo.
- Tobacco smoke of all types.
- Combustion gases from sources common to cafeterias and laboratories.
- Cross-contamination from poorly ventilated sources that leak into other air zones.

Major Indoor Air Contaminants

Although asbestos and radon have been listed below, acute health effects are not associated with these contaminants. These have been included due to recent concerns about their health effects. There may be other health effects in addition to those listed.

- **Acetic Acid**—Sources: X-ray development equipment, silicone caulking compounds. Acute health effects: Eye, respiratory and mucous membrane irritation.
- **Carbon Dioxide**—Sources: Unvented gas and kerosene appliances, improperly vented devices, processes or operations that produce combustion products, human respiration. Acute health effects: Difficulty concentrating, drowsiness, increased respiration rate.
- **Carbon Monoxide**—Sources: Tobacco smoke, fossil-fuel engine exhausts, improperly vented fossil-fuel appliances. Acute health effects: Dizziness, headache, nausea, cyanosis, cardiovascular effects, and death.
- **Formaldehyde**—Sources: Off-gassing from urea formaldehyde foam insulation, plywood, particle board, and paneling; carpeting and fabric; glues and adhesives; and combustion products including tobacco smoke.

Acute health effects: Hypersensitive or allergic reactions; skin rashes; eye, respiratory and mucous membrane irritation; odor annoyance.

- **Nitrogen Oxides**—Sources: Combustion products from gas furnaces and appliances; tobacco smoke, welding, and gas- and diesel-engine exhausts. Acute health effects: Eye, respiratory and mucous membrane irritation.
- **Ozone**—Sources: Copy machines, electrostatic air cleaners, electrical arcing, smog. Acute health effects: Eye, respiratory tract, mucous membrane irritation; aggravation of chronic respiratory diseases.
- **Radon**—Sources: Ground beneath buildings, building materials, and groundwater. Acute health effects: No acute health effects are known but chronic exposure may lead to increased risk of lung cancer from alpha radiation.
- **Volatile Organic Compounds (VOC's)**. Volatile organic compounds include trichloroethylene, benzene, toluene, methyl ethyl ketone, alcohols, methacrylates, acrolein, polycyclic aromatic hydrocarbons, and pesticides—Sources: Paints, cleaning compounds, mothballs, glues, photocopiers, “spirit” duplicators, signature machines, silicone caulking materials, insecticides, herbicides, combustion products, asphalt, gasoline vapors, tobacco smoke, dried out floor drains, cosmetics and other personal products. Acute health effects: Nausea; dizziness; eye, respiratory tract, and mucous membrane irritation; headache; fatigue.
- **Miscellaneous Inorganic Gases**. Includes ammonia, hydrogen sulfide, sulfur dioxide—Sources: Microfilm equipment, window cleaners, acid drain cleaners, combustion products, tobacco smoke, blueprint equipment. Acute health effects: Eye, respiratory tract, mucous membrane irritation; aggravation of chronic respiratory diseases.
- **Asbestos**—Sources: Insulation and other building materials such as floor tiles, dry wall compounds, reinforced plaster. Acute health effects: Asbestos is normally not a source of acute health effects. However, during renovation or maintenance operations, asbestos may be dislodged and become airborne. Evaluation of employee exposure to asbestos will normally be covered under the OSHA asbestos standard.
- **Synthetic Fibers**—Sources: Fibrous glass and mineral wool. Acute health effects: Irritation to the eyes, skin and lungs; dermatitis.
- **Tobacco Smoke**—Sources: Cigars, cigarettes, pipe tobacco. Acute health effects: Tobacco smoke can irritate the respiratory system and, in allergic or asthmatic persons, often results in eye and nasal irritation, coughing, wheezing, sneezing, headache, and related sinus problems. People who wear contact lenses often complain of burning, itching, and tearing eyes when exposed to cigarette smoke. Tobacco smoke is a major contributor to indoor air quality problems. Tobacco smoke contains several hundred toxic substances including carbon monoxide, nitrogen dioxide, hydrogen sulfide, formaldehyde, ammonia, benzene, benzo(a)pyrene, tars, and nicotine. Most indoor air particulates are due to tobacco smoke and are in the respirable range.

- **Microorganisms and Other Biological Contaminants** (Microbials). Includes viruses, fungi, mold, bacteria, nematodes, amoeba, pollen, dander, and mites—Sources: Air handling system condensate, cooling towers, water damaged materials, high humidity indoor areas, damp organic material and porous wet surfaces, humidifiers, hot water systems, outdoor excavations, plants, animal excreta, animals and insects, food and food products. Acute health effects: Allergic reactions such as hypersensitivity diseases (hypersensitivity pneumonitis, humidifier fever, allergic rhinitis, etc.) and infections such as legionellosis are seen. Symptoms include chills, fever, muscle ache, chest tightness, headache, cough, sore throat, diarrhea, and nausea.

Approximately five percent of indoor air problems involve some type of microbiological contamination. Such contamination can result from water damage to carpets or furnishings, or from standing water in ventilation system components. A respiratory problem known as hypersensitivity pneumonitis can result from bacteria, fungi, protozoa, and microbiological products that may originate in ventilation system components.

OUTSIDE AIR CONTAMINANTS

NIOSH has determined that approximately 10 percent of indoor problems are due to contamination from outside the office space. Examples of these contaminants are motor vehicle exhaust fumes, boiler gases, and previously exhausted air. Major sources are improperly located exhaust and intake vents and periodic changes in wind conditions.

One of the most common contaminants from outside is carbon monoxide gas from basement parking garages, recirculated through the building ventilation system. Other outside contaminants include the by-products of construction or renovation, such as asphalt, solvents, and dusts. Gasoline vapors can infiltrate the basement and/or sewage system and are usually caused by gasoline leaks from ruptured underground tanks at nearby service stations.

INADEQUATE VENTILATION

Inadequate ventilation is by far the largest problem associated with poor indoor air quality. Ventilation problems commonly encountered include:

- Insufficient outdoor air supplied to the office space.
- Poor air distribution and mixing which causes stratification, draftiness, and pressure differences between office spaces.
- Extremes of fluctuations in temperature and humidity (sometimes caused by poor air distribution).
- Air filtration problems caused by improper or inadequate maintenance to the building ventilation system.

In many cases, these ventilation problems are created or exacerbated by energy conservation measures. Such measures include reducing or eliminating out-

door air; reducing infiltration and exfiltration; lowering thermostats in the winter and raising them in the summer; eliminating humidification or dehumidification systems; and early shutdown and late start-up of ventilation systems.

CONTROL STRATEGIES

Four control strategies can be implemented to reduce indoor air pollution: education and training; dilution ventilation; modifying processes and/or equipment; and air cleaning.

Education and Training

The employer should provide all office employees with timely information on the health and physical hazards associated with office products and materials. Employers are required by the OSHA hazard communication standard to develop and implement a hazard communication program where any hazardous chemicals are known to be present and to which employees may be exposed. The required hazard communication program details information and training that employees must receive.

Dilution Ventilation

Ventilation systems are designed to supply sufficient oxygen for normal respiration, to dilute contaminants in occupied spaces, to remove contaminants emitted from work areas, and to control odors. The American Society of Heating, Refrigeration, Air Conditioning Engineers (ASHRAE) is a private standard setting organization that has developed specific ventilation standards which are often incorporated into building codes. Most ventilation systems meet the design standards set by state and local building codes.

The primary method of controlling air contaminants in most buildings is general ventilation. Dilution ventilation requires a clean air supply, to dilute all the contaminants of concern, and exhaust openings, located near the contaminant source or work area.

Recirculation of exhausts can be avoided by locating the intake and outlet remotely. Reentry of exhaust air can be avoided by discharging exhaust above the roof away from openings and air intakes. Diluting contaminants through ventilation should not be used where:

- There are dust- or fume-producing operations.
- Highly toxic air contaminants are present.
- Large quantities of contaminants are produced.
- Contaminants are released in nonuniform quantities.
- Makeup air is unavailable or tempering the air is economically infeasible.

In the above instances, properly designed local exhausts may be more effective for controlling air quality.

Modifying Processes and/or Equipment

Pollution emission rates may be reduced by modifying processes and/or equipment. Polluting substances that are part of the work process may simply be eliminated. Less toxic materials may be available to substitute for contaminating substances, or the quantity of contaminating substances may be reduced. Equipment may be subject to modification that would reduce contamination. Using equipment differently or installing barriers may also reduce emissions at their source.

Air Cleaning

This control strategy involves removing air contaminants before the air is recirculated. Filters and electronic air cleaners are common particle removal devices. Adsorption and absorption are removal techniques for pollutant gases. Air conditioning is primarily a comfort device, but some concentrations of pollen and other particulate matter are slightly reduced by air conditioning.

RECOMMENDED VENTILATION RATES

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) established recommended ventilation rates for indoor environments in 1973. ASHRAE amended this standard in 1975 to specify the minimum value of 5 cubic feet per minute (CFM) of outdoor air per person to be used in building design. This standard has been incorporated into the building codes of many cities and states. The 62-1989 standard recommends a minimum of 15 CFM of outdoor air per person for offices (reception areas) and 20 CFM per person for general office space with a moderate amount of smoking. Sixty CFM per person is recommended for smoking lounges with local mechanical exhaust ventilation and no air recirculation.

TYPES OF BUILDING PROBLEMS

Employee complaints can be due to two types of building problems: sick or tight building syndrome and building-related illnesses.

Sick building syndrome is a condition associated with complaints of discomfort including headache; nausea; dizziness; dermatitis; eye, nose, throat, and respiratory irritation; coughing; difficulty concentrating; sensitivity to odors; muscle pain; and fatigue. The specific causes of the symptoms are often not known but sometimes are attributed to the effects of a combination of substances or individual susceptibility to low concentrations of contaminants. The symptoms are associated with periods of occupancy and often disappear after the worker leaves the worksite.

Building-related illnesses are those for which there is a clinically defined illness of known etiology and include infections such as legionellosis and allergic reactions such as hypersensitivity diseases and are often documented by physical signs and laboratory findings. A more thorough description of these illnesses can be found in the American Conference of Governmental Industrial Hygienists (ACGIH) guidelines on evaluating bioaerosols.

Indoor air quality problems are generally classified as “sick building syndrome” (SBS) or “building-related illness” (BRI). Conditions associated with SBS are not easily traced to a specific substance but are usually believed to result from some unidentified contaminant or combination of contaminants.

The symptoms associated with SBS include:

- Eye irritation.
- Dry skin.
- Nose irritation.
- Erythema (skin reddening).
- Irritation of the throat.
- Headache.
- Dry mucous membranes.
- Hoarseness.
- Wheezing.
- Mental fatigue.
- Nausea.
- Respiratory infections.
- Dizziness.
- Cough.

The symptoms of SBS are relieved when the employee leaves the building and may be reduced or eliminated by modifying the ventilation system.

BRI describes specific medical conditions that have a known origin. These illnesses can be severe and, unlike SBS, can often be traced to a single contaminant source such as mold infestation and/or microbial growth in cooling towers, air-handling systems, and water damaged furnishings. Symptoms may not disappear when the employee leaves the building. Building-related illnesses include:

- Respiratory allergies.
- Nosocomial (hospital) infection.
- Humidifier fever.
- Hypersensitivity pneumonitis.
- Legionnaires’ disease.

EVALUATION

In order to determine if a possible relationship between any adverse health symptoms and indoor air quality exist, an industrial hygienist can be hired to conduct an indoor air quality survey. This survey will consist of an evaluation of potential sources of pollutants, a measurement program that involves selecting appropriate instrumentation and designing the monitoring effort, and, finally, an interpretation of the data gathered. In many situations, the cause of the inadequate indoor air quality

can be recognized and certain mitigation measures suggested and/or implemented. The evaluation process often involves the following steps:

1. Interviews with the employer and employees.
2. A walkaround inspection of the office building.
3. An environmental evaluation that will entail sampling.
4. Final report on evaluation with recommendations.

SUMMARY

Many factors come into play when the environment of a building is considered. At times you may not realize the various questions that you should ask to determine if the quality of the environmental factors in the building are of the right levels and that environmental equipment is working in an effective manner to provide the type of office environment in which workers can be productive. To assist you in this endeavor a checklist can be found in Figure 13-2 that you can modify to meet the specific environmental needs in your office building.

ENVIRONMENT QUALITY OFFICE BUILDING CHECKLIST

A walk-through inspection should include the office premises, its air-conditioning system and any other ventilation installations. The purpose of the inspection checklist is to identify irregularities. The following checklist is provided as a guide and is not meant to be exhaustive. Where necessary, assistance should be sought from the building manager to tailor it to your office building.

Human exposure and comfort levels

- ☐ Yes ☐ No Does the building house too many occupants?
- ☐ Yes ☐ No Is the environment controlled during the times occupants are in the building?
- ☐ Yes ☐ No Is the indoor temperature regulated by thermostats?
- ☐ Yes ☐ No Have thermostats been correctly positioned in proper location in the building?
- ☐ Yes ☐ No Are thermostats set to the correct temperature?
- ☐ Yes ☐ No Is there discomfort from heat radiation from visual display units?
- ☐ Yes ☐ No Is there discomfort due to radiant heat from warm window surfaces?
- ☐ Yes ☐ No Are temperature, relative humidity and air flow rates checked regularly during working hours?
- ☐ Yes ☐ No Does air reach all parts of the office or are there dead spaces?
- ☐ Yes ☐ No Are there any flickering fluorescent tubes?

- ☐ Yes ☐ No Are fluorescent tubes regularly replaced before there are obvious signs of wear?
- ☐ Yes ☐ No Is the building still being used for the purpose it was intended?
- ☐ Yes ☐ No Have partitions/walls been added or removed?
- ☐ Yes ☐ No Have occupancy levels changed?

Potential sources of contaminants

- ☐ Yes ☐ No Are there occupants smoking in any room or area?
- ☐ Yes ☐ No Is there office equipment giving off gases or fumes?
- ☐ Yes ☐ No Are there photocopiers or other equipment giving off potentially harmful gases/fumes?
- ☐ Yes ☐ No If so, is the equipment supplied with separate exhaust ventilation?
- ☐ Yes ☐ No Does the exhaust convey air to the exterior of the building, into corridors or into the air conditioning system?
- ☐ Yes ☐ No Are there furniture, furnishings, carpets, etc. that emit noticeable odors?
- ☐ Yes ☐ No Are biocides added to the system to control growth of microorganisms?
- ☐ Yes ☐ No Is there urea-formaldehyde insulation in the walls? Or is there furniture, furnishings, carpets, etc. that are likely to give off formaldehyde gas?
- ☐ Yes ☐ No Have wood preservatives or other chemicals been used in the building?
- ☐ Yes ☐ No Is there any asbestos in the building?
- ☐ Yes ☐ No Are detergents, pesticides or other chemicals been used in the building?
- ☐ Yes ☐ No Is renovation work being undertaken in any part of the building?
- ☐ Yes ☐ No Is renovation or construction work done during working hours?
- ☐ Yes ☐ No Is there a kitchen where cooking is done?
- ☐ Yes ☐ No Does the kitchen have exhaust ventilation provided?
- ☐ Yes ☐ No Is the building adequately cleaned?
- ☐ Yes ☐ No Is regular dusting of office furniture, shelves, etc. carried out to help keep dust to a minimum?
- ☐ Yes ☐ No Are the carpets vacuumed regularly?

Ventilation and air conditioning

- ☐ Yes ☐ No Are there adequate intake supply air and return air vents in each room or is there at least one each in every room?
- ☐ Yes ☐ No Are vents located in positions that will permit the best air circulation?
- ☐ Yes ☐ No Are supply air or return air vents blocked in any way by partitions, files, or structures that obstruct air flow?

- ☐ Yes ☐ No Has dust collected around the air vents?
- ☐ Yes ☐ No Is the air conditioning system turned off any time during the day?
- ☐ Yes ☐ No Is the system turned off after office hours?
- ☐ Yes ☐ No Are there still occupants in the building after office hours?
- ☐ Yes ☐ No Is the outdoor air intake duct easily located?
- ☐ Yes ☐ No Is the intake near the cooling tower building or is it near adjacent buildings?
- ☐ Yes ☐ No Is the intake at street level or near car traffic?
- ☐ Yes ☐ No Is the intake blocked in any way?
- ☐ Yes ☐ No Are heavy industries located nearby?
- ☐ Yes ☐ No Is there any construction going on nearby?
- ☐ Yes ☐ No Is outdoor air actually getting into the building?
- ☐ Yes ☐ No Are filters used?
- ☐ Yes ☐ No Are filters adequate?
- ☐ Yes ☐ No Are filters bypassed?
- ☐ Yes ☐ No Are filters cleaned or replaced?
- ☐ Yes ☐ No Is there a regular schedule for cleaning and maintenance of the air conditioning system in the building?
- ☐ Yes ☐ No Are all the components of the air conditioning system regularly inspected for leaks, breaks, etc.?

Humidification

- ☐ Yes ☐ No Is there a humidification system?
- ☐ Yes ☐ No If so, what type of humidifier/dehumidifier is used?
- ☐ Yes ☐ No Is the humidification system actually operating?
- ☐ Yes ☐ No Is the humidification system in working order?
- ☐ Yes ☐ No Is it clean and free from contamination with microorganisms?

Figure 13-2. Environmental quality office building checklist.

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CHAPTER 14

OFFICE BUILDING CHEMICAL HAZARDS



Poor practices in the storage of chemicals used in an office area.

Chemicals in office buildings present some unique hazards. This is especially true if you are not the sole owner/occupant or employer in the office building. If the office has multiple employers, it is difficult to know what chemicals are coming into the building. Even with multi-employer workplaces, a centralized comprehensive list of all chemicals in use in the building should be generated. A complete repository of Material Safety Data Sheets (MSDSs) for each chemical should be maintained in a safe and easily accessible location in case of an emergency, a spill, or a release. The storage area or location for each chemical should be identified. This will be very useful for firefighters and emergency medical personnel who must respond to fires, releases, spills, or medical exposure incidents.

CHEMICALS AND ILLNESS

The 372,000 occupational illnesses include repeat trauma such as carpal tunnel syndrome, noise-induced hearing loss, and poisonings. It is suspected that

many occupational illnesses go unreported when the employer or worker is not able to link exposure with the symptoms the employees are exhibiting. Also, physicians fail to ask the right questions regarding the patient's employment history, which can lead to the commonest of diagnoses, a cold or flu, rather than of an occupationally related illness or exposure. This has become very apparent with the recent occupational exposure to anthrax where a physician sent a worker home with anthrax without addressing the potential occupational exposure hazards. Unless physicians are trained in occupational medicine, they seldom address work as the potential exposure source.

This is not entirely a physician problem by any means since the symptoms that are seen by the physician are often those of flu and other common illnesses suffered by the general public. It is often up to the employee to make the physician aware of their on-the-job exposure. If you notice, the term that has been continuously used is the term exposure since, unlike trauma injuries and deaths, that are usually caused by the release of some source of energy, occupational illnesses are often due to both short-term and long-term exposures. If the results of an exposure leads to immediate symptoms, it is said to be acute. If the symptoms come at a later time, it is termed a chronic exposure. The time between exposure and the onset of symptoms is called the latency period. It could be days, weeks, months, or even years, as in the case of asbestos where asbestosis or lung cancer appears 20 to 30 years after exposure. After looking at large numbers of death certificates (20,000) from specific groups of workers, you often see a significant number of cases of specific types of cancer such as liver, thyroid, or pancreatic cancer that do not appear in the same number in the normal adult population. This leads one to believe that something the workers were exposed to in the work environment may have caused their demise.

It is often very difficult to get employers, supervisors, and employees to take seriously the exposures in the workplace as a potential risk to the workforce both short- and long-term, especially long-term. It can't be too bad if I feel all right now. This false sense of security is illustrated by the 90,000 occupational illness deaths that are estimated by the Bureau of Labor Statistics to occur each year. This far surpasses the 6,000 occupation trauma deaths a year. If both trauma and illness deaths are added together it would be equivalent to the lives lost to a jumbo jet crashing every day of the year. Would an aviation record like this be acceptable to you? I doubt that you would be flying. It is time for employers and the workforce to take on-the-job exposures as a potentially serious threat.

It is widely believed that many of the ill effects that workers suffer are in all likelihood linked to their chemical exposure at work. But not as much has been made of the chemical exposure to office workers in their containerized environment where the chemical vapors, mist, and particles can be spread throughout the building by the ventilation system. Only in recent years has the term "sick building syndrome" become a commonly used term.

HEALTH HAZARDS

Health hazards are caused by any chemical or biological exposure that interacts adversely with organs within our body causing illnesses or injuries. The majority of chemical exposures result from inhaling chemical contaminants in the form of vapors, gases, dusts, fumes, and mists, or by skin absorption of these materials.

The degree of the hazard depends on the length of exposure time and the amount or quantity of the chemical agent. This is considered to be the dose of a substance. A chemical is considered a poison when it causes harmful effects or interferes with biological reactions in the body. Only those chemicals that are associated with a great risk of harmful effects are designated as poisons.

Dose is the most important factor determining whether or not you will have an adverse effect from a chemical exposure. The longer you work at a job and the more chemical agent that gets into the air or on your skin, the higher the dose potential. Two components that make up dose are:

- The length of exposure, or how long you are exposed—one hour, one day, one year, 10 years, etc.
- The quantity of substance in the air (concentration), how much you get on your skin, and/or the amount eaten or ingested.

Another important factor to consider about the dose is the relationship of two or more chemicals acting together that cause an increased risk to the body. This interaction of chemicals that multiply the chance of harmful effects is called a synergistic effect. Many chemicals can interact and although the dose of any one chemical may be too low to affect you, the combination of doses from different chemicals may be harmful. For example, the combination of chemical exposures and a personal habit such as cigarette smoking may be more harmful than just an exposure to one chemical. Smoking and exposure to asbestos increases the chance of lung cancer by as much as 50 times.

The type and severity of the body's response is related to dose and the nature of specific contaminant present. Air that looks dirty or has an offensive odor may, in fact, pose no threat whatsoever to the tissues of the respiratory system. In contrast, some gases that are odorless or at least not offensive can cause severe tissue damage. Particles that normally cause lung damage can't even be seen. Many times, however, large visible clouds of dust are a good indicator that smaller particles may also be present.

Many chemicals used in the workplace can damage the body. Effects range from skin irritation and dermatitis to chronic lung diseases such as silicosis and asbestosis or even cancer. The body may be harmed at the point where a chemical touches or enters it. This is called a local effect. When the solvent benzene touches the skin, it can cause drying and irritation (local effect).

A systemic effect develops at some place other than the point of contact. Benzene can be absorbed through the skin, breathed into the lungs, or ingested. Once in the body, benzene can affect the bone marrow, leading to anemia and leukemia. (Leukemia is a kind of cancer affecting the bone marrow and blood.) Adverse health effects may take years to develop from a small exposure or may occur very quickly from large concentrations.

The body is a complicated collection of cells, tissues, and organs having special ways of protecting itself against harm. These are usually called the body's defense systems. The body's defense system can be broken down, overcome, or bypassed. When this happens, injury or illness can result. Sometimes job-related injuries or illness are temporary, and you can recover completely. Other times, as in the case of chronic lung diseases such as silicosis or cancer, permanent changes may lead to death.

Acute Health Effects

Chemicals can cause acute (short-term) or chronic (long-term) effects. Whether or not a chemical causes an acute or chronic reaction depends both on the chemical and the dose you are exposed to. Acute effects are seen quickly, usually after exposures to high concentrations of a hazardous material. For example, the dry cleaning solvent perchloroethylene can immediately cause dizziness, nausea and at higher levels, coma and death. Most acute effects are temporary and reverse shortly after being removed from the exposure. But at high enough exposures permanent damage may occur. For most substances neither the presence nor absence of acute effects can be used to predict whether chronic effects will occur. Dose is the determining factor. Exposures to cancer-causing substances (carcinogens) and sensitizers may lead to both acute and chronic effects.

An acute exposure may occur, for example, when we are exposed to ammonia while using a cleaning agent. Acute exposure may have both immediate and delayed effects on the body. Nitrogen dioxide poisoning or exposure is often followed by signs of brain impairment (such as confusion, lack of coordination, and behavioral changes) days or weeks after “recovery.”

Chemicals can cause acute effects on breathing. Some chemicals irritate the lungs and some sensitize the lungs. Fluorides, sulfides, and chlorides are all found in various welding and soldering fluxes. During welding and soldering, these materials combine with the moisture in the air to form hydrofluoric, sulfuric, and hydrochloric acid. All three can severely burn the skin, eyes and respiratory tract. High levels can overwhelm the lungs, burning and blistering them, and causing pulmonary edema. (Fluid building up in the lungs that will cause shortness of breath and if severe enough can cause death.)

In addition, chemicals can have acute effects on the brain. When inhaled, solvent vapors enter the blood stream and travel to other parts of the body, particularly the nervous system. Most solvents have a narcotic effect. This means they affect the nervous system by causing dizziness, headaches, feelings of “drunkenness,” and tiredness. One result of these symptoms may be poor coordination, which can contribute to falls and other accidents on a worksite. Exposure to some solvents may increase the effects of alcoholic beverages.

Chronic Health Effects

Chronic exposure occurs during longer and/or repeated periods of contact, sometimes over years and often at relatively low concentrations of exposure. Perchloroethylene or alcohol, for example, may cause liver damage or other cancers 10 to 40 years after first exposure. This period between first exposure and the development of the disease is called the latency period. An exposure to a substance may cause adverse health effects many years from initial exposure with little or no effects at the time of exposure. It is important to avoid or eliminate all exposures to chemicals that are not part of normal ambient breathing air. For many chemical agents, the toxic effects following a single exposure are quite different from those produced by repeated exposures. For example, the primary acute toxic effect of benzene is central nervous system damage, while chronic exposures can result in leukemia.

There are two ways to determine if a chemical causes cancer—studies conducted on people and studies on animals. Studies on humans are expensive, hard to

do, and very often not even possible. This type of long-term research is called epidemiology. Studies on animals are less expensive and easier to do. This type of research is sometimes referred to as toxicology. Results showing increased occurrences of cancer in animals are generally accepted to indicate that the same chemical causes cancer in humans. The alternative to not accepting animal studies is to have a lot less knowledge about the health effects of chemicals. We would never be able to determine the health effects of the more than 100,000 chemicals used by industry.

There is no level of exposure to cancer-causing chemicals that is safe. Lower levels are considered safer. One procedure for setting health standard limits is called risk assessment. Risk assessment on the surface appears very scientific yet the actual results are based on many assumptions. It is differences in these assumptions that allow scientists to come up with very different results when determining an acceptable exposure standard. Following are major questions that assumptions are based on:

- Is there a level of exposure below which a substance won't cause cancer or other chronic diseases? (Is there a threshold level?)
- Can the body's defense mechanisms inactivate or break down chemicals?
- Does the chemical need to be at a high enough level to cause damage to a body organ before it will cause cancer?
- How much cancer should we allow? (One case of cancer among one million people, or one case of cancer among one hundred thousand people, or one case of cancer among ten people?)

For exposures at the current permissible exposure limit (PEL), the risk of developing cancer from vinyl chloride is about 700 cases of cancer for each million workers exposed. The risk for asbestos is about 6,400 cases of cancer for each million workers exposed. The risk for coal tar pitch is about 13,000 cases for each million workers exposed. Permissible exposure limits set for current federal standards differ because of these different risks.

The dose of a chemical causing cancer in human or animal studies is then used to set a standard PEL below which only a certain number of people will develop illness or cancer. This standard is not an absolutely safe level of exposure to cancer causing agents, so exposure should always be minimized even when levels of exposure are below the standard. Just as the asbestos standard has been lowered in the past from 5 fibers/cubic centimeter (f/cc) to .2 f/cc, and now to .1f/cc (50 times lower), it is possible that other standards will be lowered in the future as new technology for analysis is discovered and the public insists on fewer deaths for a particular type of exposure. If a chemical is suspected of causing cancer, it is best to minimize exposure, even if the exposure is below accepted levels.

Chronic Disease

Chronic disease is not always cancer. There are many other types of chronic diseases, which can be as serious as cancer. These chronic diseases affect the function of different organs of the body. For example, chronic exposure to asbestos or silica dust (fine sand) causes scarring of the lung. Exposure to gases such as nitrogen oxides or ozone may lead to destruction of parts of the lung. No matter what the cause, chronic disease of the lungs will make the individual feel short of breath and

limit activity. Depending on the extent of disease, chronic lung disease can kill. In fact, it is one of the top ten causes of death in the United States.

Scarring of the liver (cirrhosis) is another example of chronic disease. It is also one of the top ten causes of death in the United States. The liver is important in making certain essential substances in the body and cleaning certain waste products. Chronic liver disease can cause an individual to be tired all the time, have their muscles waste away, and cause swelling of their stomach from fluid accumulation. Many chemicals such as carbon tetrachloride, chloroform, and alcohol can cause cirrhosis of the liver.

The brain is also affected by chronic exposure. Chemicals such as lead can decrease IQ, decrease ability to remember things, and/or make someone more irritable. Many times these changes are small and can be found only with special medical tests. Workers exposed to solvents, such as toluene or xylene in oil-based paints, may develop neurological changes over a period of time.

Scarring of the kidney is another example of a chronic disease. Individuals with severe scarring must be placed on dialysis to remove the harmful waste products or have a kidney transplant. Chronic kidney disease can cause an individual to be tired all the time, have high blood pressure and swollen feet, as well as many other symptoms. Lead, mercury, and solvents are suspected causes of chronic kidney disease.

Birth Defects/Infertility

The ability to have a healthy child can be affected by chemicals in many different ways. A woman may be unable to conceive because a man is infertile. The production of sperm may be abnormal, reduced, or stopped by chemicals that enter the body. Men working in an insecticide plant manufacturing 1,3-dibromo-3-chloropropane (DBCP) realized, after talking among themselves, that none of their wives had been able to become pregnant. When tested, all the men were found to be sterile.

A woman may be unable to conceive or may have frequent early miscarriages because of mutagenic or embryotoxic effects. Changes in genes in a woman's ovaries or a man's sperm from exposure to chemicals may cause the developing embryo to die. A woman may give birth to a child with a birth defect because of a chemical with mutagenic or teratogenic effects. When a chemical causes a teratogenic effect, the damage is caused by the woman's direct exposure to the chemical. When a chemical causes a mutagenic effect, changes in genes from either the man or woman have occurred.

HAZARDOUS CHEMICALS

Hazardous and toxic (poisonous) substances can be defined as those chemicals present in the workplace that are capable of causing harm. In this definition, the term "chemicals" includes dusts, mixtures, and common materials such as paints, fuels, and solvents. OSHA currently regulates exposure to approximately 400 substances. The OSHA Chemical Sampling Information file contains a listing for approximately 1,500 substances. The EPA's Toxic Substance Chemical Act: Chemical Substances Inventory lists information on more than 62,000 chemicals or chemical substances. Some libraries maintain files of Material Safety Data Sheets for more than 100,000 substances. It is not possible to address the hazards associated with each of these chemicals.

Since there is no evaluation instrument that can identify the chemical or the amount of chemical contaminant present, it is not possible to be able to make a real-time assessment of a worker's exposure to potentially hazardous chemicals. Additionally, threshold limit values (TLVs) provided by the American Conference of Governmental Industrial Hygienists (ACGIH) in 1968 are the basis of OSHA's Permissible Exposure Limits (PELs). In the early 2000s, workers were being provided protection with chemical exposure standards that are 32 years old. The ACGIH regularly updates and changes its TLVs based upon new scientific information and research.

The United States Environmental Protection Agency allows for one death or one cancer case per million people exposed to a hazardous chemical. Certainly the public needs these kinds of protections. Using the existing OSHA PELs risk factor is only as protective as one death due to exposure in 1,000 workers. This indicates that there exists a "fence line mentality" which suggests that workers entering the workplace can tolerate higher exposures than what the public would be subjected to. As one illustration of this, the exposure to sulfur dioxide for the public is set by the EPA at .14 ppm average over 24 hours, while the OSHA PEL is five ppm average over eight hours. Certainly, there is a wide margin between what the public can be subjected to and what a worker is supposed to be able to tolerate. The question is, "Is there a difference between humans in the public arena and those in the work arena?" Maybe workers are assumed to be more immune to the effects of chemicals when they are in the workplace than when they are at home. Workplace regulations and precautions are assumed by workers to be protective when in fact they may not be since many chemical exposure levels have not been updated since 1966.

A more significant issue is that regarding mixtures. The information does not exist to show the risk of illnesses, long-term illnesses, or the toxicity of combining these hazardous chemicals. At present, it is assumed that the most dangerous chemical of the mixture has the most potential to cause serious health-related problems than the next most hazardous, and so on. But, little consideration is given regarding the increase in toxicity, long-term health problems, or present hazards. Since most chemicals used in industry are mixtures, formulated by manufacturers, it makes it even more critical to have access to the MSDSs and take a conservative approach to the potential for exposure. This means that any signs or symptoms of exposure should be addressed immediately; worker complaints should be addressed with sincerity and true concern; and employers should take precautions beyond those called for by MSDSs if questions prevail.

Actually, the amount of information that exists on dose/response for chemicals and chemical mixtures is limited. This is especially true for long-range effects. If a chemical kills or makes a person sick within minutes or hours, the dose response is easily understood. But if chemical exposure over a long period results in an individual's death or illness, then the dose needed to do this is, at best, a guess. The exposure to chemicals that workers receive most certainly does not take into account other chemicals the worker was exposed to during his/her work life and whether they exacerbated the effects or played no role in the individual's death or illness. This is why it is critical for individual workers to keep their exposure to chemicals as low as possible. Even then, there are no guarantees that they may not come down with an occupational disease related to chemical exposure.

Many employers and workers as well as physicians are not quick or trained to identify the symptoms of occupational exposure to chemicals. In one case, two men painted for eight hours with a paint containing 2-nitropropane in an enclosed

environment. At the end of their shift one of the workers felt ill and stopped at the emergency center at the hospital. After examination, he was told to go home and rest and would probably be better in the morning. Later that evening, he returned to the hospital and died of liver failure from 2-nitropropane exposure. The other worker suffered irreparable liver damage but survived. No one asked the right questions regarding occupational exposure. The symptoms were probably similar to a common cold or flu, which is often the case unless some detective work is done. Often those with chemical poisoning or exposures are sent home to off-gas or excrete the contaminant during the 16 hours that they are at their homes where they have no exposure, and their symptoms usually disappear. They feel better the next day and return to work and are re-exposed. Thus, the worker does not truly recognize this as a poisoning process. Being aware of the chemicals used, reviewing the MSDSs, and following the recommended precautions are important to the safe use of hazardous chemicals.

With this point made, it becomes critical that employers know the dangers that the chemicals present to their workforce. Employers need to get and review MSDSs for all chemicals in use on their worksite and take the proper precautions recommended by the MSDSs. Also, it behooves workers to get copies of MSDSs for chemicals they use (see Figure 14-1).



Figure 14-1. Are these chemicals hazardous to workers? Get an MSDS for each one to help judge the hazards posed.

MSDSs can also provide information for training employees in the safe use of materials. These data sheets, developed by chemical manufacturers and importers, are supplied with manufacturing or construction materials and describe the ingredients of a product, its hazards, protective equipment to be used, safe handling procedures, and emergency first-aid responses. The information contained in these sheets can help employers identify employees in need of training (i.e., workers handling substances described in the sheets) and train employees in safe use of the substances. MSDSs are generally available from suppliers, manufacturers of the substance, large

employers who use the substance on a regular basis, or MSDSs may be developed by employers or trade associations. MSDSs are particularly useful for those employers who are developing training in safe chemical use as required by OSHA's Hazard Communication Standard. An example of a MSDS and a blank OSHA form for a MSDS can be found in Appendix E.

Carcinogens

Carcinogens are any substances or agents that have the potential to cause cancer. Whether these chemicals or agents have been shown to cause cancer only in animals should make little difference to employers and their workers. Employers and their workers should consider these as cancer-causing on a precautionary basis since all is not known regarding their effects upon humans on a long-term basis. Since most scientists say that there is no known safe level of a carcinogen then zero exposure should be the goal of workplace health and safety. Do not let the label "suspect" carcinogen or agent put your mind at ease. This chemical or agent can cause cancer.

OFFICE CHEMICALS

Office chemicals come in many forms and types. It is important to be familiar with the most common chemicals that can be found in an office environment. It is impossible to address all the chemicals that could potentially exist in an office building. You may need to consult an industrial hygienist when you have special needs or problems. The following entries discuss forms and general chemicals and the potential dangers from each of them.

Dusts

Dusts are solid particles suspended in air. Dusts may be produced by abrasive activities, crushing, grinding, sanding, sawing, or the impact of materials against each other. Some dusts have no effect on the body. They don't seem to harm the body or be changed by the body's chemistry into other harmful substances. Most harmful dusts cause damage after being breathed. Some, such as cement and arsenic, can also directly affect the skin.

When considering health effects from inhaled dust, we must be concerned about a solid material that is small enough to reach the air sacs in our lungs where oxygen and carbon dioxide exchange takes place. This area is called the alveoli. Only particles smaller than about 5 micrometers (μm) or microns (about 1/100 the size of a speck of pepper) are likely to reach this area of the lung. Particles in the range 5–10 μm will be deposited in the upper respiratory tract airways (nose, throat, trachea, and major bronchial tubes) and cause bronchitis. Particles larger than 10 μm , like wood dusts, can deposit in the nasal airways with the possibility of causing nasal ulcerations and cancer. Particles smaller than about 1 μm are likely to be exhaled during normal breathing.

The body has defenses against dusts. The most damaging dusts to the alveoli are small enough to get past these defenses and are too small to be seen with the naked eye. We call these "respirable" or breathable dusts. Your body's defenses against large-sized dusts that get lodged in the trachea are mucous and the hair-like cells

called cilia. Cilia work like an escalator, moving particles back to the throat where it is swallowed or coughed up. Cigarette smoke paralyzes the cilia, which is the likely reason that smokers have about 50 times the normal cancer rate.

Special white blood cells or macrophages can capture and remove damaging dust. Often these cells can be overwhelmed with large or chronic exposures. Some chemicals can dry out the mucous. A result of such a breakdown is more dust particles reaching the lungs where the contaminant is eventually absorbed by the blood and carried to target organs. A broad term used to describe lung injury developed from chronic effects of breathing dusts is called pneumoconiosis (pronounced, new-mo-cone-e-o-sis). This tongue-twisting Greek word means “lung” and “dust” or “dusty lung.”

Fumes

Fumes, like dust, are also solid particles in the air. They are usually formed when metals are heated to their melting points, especially during welding or soldering. Solder, electrode, welding rod, or metallic coating on materials may be vaporized generating additional fumes. Chromium and nickel exposures are possible when fumes are generated from stainless steel during arc welding. Sometimes plumbers generate lead fumes when molten lead is used for joining black pipe. Lead fumes are also generated by melting lead to make fishing sinkers or burning lead paint off surfaces.

Although many fumes can irritate the skin and eyes, these fine particles primarily affect the body when they are inhaled. This type of exposure sometimes results in an acute health effect, referred to as “metal fume fever” especially if the fumes are from metals such as zinc, cadmium, or magnesium. Workers often generate a lot of lead and metal fumes during demolition projects when using torches to cut and burn “I” beams. Dangerous fumes may also be produced by heating asphalt during hot tar roofing or road paving. An ingredient used in this process is called “coal tar pitch.” These hazardous fumes are regarded as a serious cancer threat.

Fume particle’s small size allows many of them to get past the body’s natural defenses. They can then reach and irritate the lungs. Their small size and ability to spread out in the lung fluids allow fumes to pass easily from the lungs into the blood stream, thereby damaging other parts of the body. Many fumes, such as lead, affect the liver, kidneys, and nervous system and are called systemic poisons.

Gases

Gases are formless at room temperature and always expand to fill their containers. They can be changed into liquids or solids by increasing the pressure and/or decreasing their temperature. It is in these changed forms that gases are normally stored and/or transported. Toxic gases can directly irritate the skin, throat, eyes, or lungs, or they may pass from the lungs into the bloodstream to damage other parts of the body. Some gases such as methane can also cause a worker to suffocate by displacing oxygen in the air. Many fatalities have occurred due to improper entry into confined spaces such as underground silos containing manure. As the manure decays it generates methane gas displacing the oxygen.

The body’s defenses against some gases include smell, tearing eyes, and coughing. Ammonia’s irritating effects and odor warn workers of exposure. However, workers may be exposed to some gases without knowing it. Carbon monoxide

is the most widespread gas risk. It can be found whenever heavy equipment or motors are used. It is a colorless, odorless gas formed by burning carbon-containing materials such as coal, oil, gasoline, wood, or paper. The chief source of carbon monoxide in the environment is the automobile. Carbon monoxide has no warning properties. You can't see or smell it, and it doesn't irritate the nose, eyes, throat, or lungs. Special respirators must be used due to the lack of warning properties.

Other gases, such as hydrogen sulfide with its characteristic rotten egg odor, may dull the sense of smell after awhile. Then the natural warning sign of odor no longer works. Therefore, the sense of smell is a poor way of detecting any type of exposure to hazardous substances and workers should not rely on it.

Oxygen, hydrogen, nitrogen, and air, stored in steel cylinders, are among the many gases that are used routinely on construction sites. These cylinders should be stored in an upright position, strapped securely to a permanent structure, and protected from high temperature. Gases in cylinders are generally safe under such conditions as long as the temperature of the gas does not exceed 125° Fahrenheit. Beyond this temperature, the cylinder might burst.

Mists

Mists and fogs are drops of liquid suspended in the air. Fogs may be created by vapors condensing to the liquid state, while mists are droplets splashed or sprayed. Examples of mists used in construction include oil mist sprayed onto concrete forms, paint spray mists, and acid mists produced by fluxes used in soldering. Many mists and fogs can damage the body if they are breathed or if they make direct contact with skin or eyes. Like fumes, mists are small enough to bypass the respiratory system's defenses and get deep inside the lungs. There they pass easily into the blood stream, then into other parts of the body.

Vapors

Vapors are gaseous forms of certain materials that are usually solid or liquid at room temperatures. Vapors may be formed when liquids or solids are heated. Some materials, such as solvents, form vapors without being heated. Solvent vapors are one of the most common exposures at a hazardous waste and/or construction site. Mercury is an example of a metal that vaporizes at room temperature and can be a serious health hazard. Mercury was used by our ancestors during felt-hat manufacturing. Hence the name "mad hatters" due to central nervous system damage. Both vapors and the materials from which they evaporate can harm the body. Many directly affect the skin causing dermatitis, while some can be absorbed through the skin. As with gases and fumes, most vapors when breathed pass to the bloodstream and damage other parts of the body. Some of these materials can damage the liver, kidneys, and blood or cause cancer.

TYPICAL HAZARDOUS OFFICE CHEMICALS

There are many different types of hazardous chemicals used in industry that you may be exposed to. Many of these chemicals can be grouped into a set of general categories because they pose the same types of hazards. In this way it simplifies the

general hazards that may be encountered on the work site. Hazards associated with some common materials found in office buildings are reviewed in paragraphs below:

- Solvents
- Acids and Bases
- Fuels
- Cleaners
- Adhesives and Sealants

Solvents

A solvent is a liquid that dissolves another substance without changing the basic characteristic of either material. When the solvent evaporates, the original material is the same. In construction, we most often see them as cleaners, degreasers, thinners, fuels, and glues. Solvents are lumped into three main types or classes: those containing water (aqueous solutions) such as acids, alkalizes and detergents; those containing carbon (organic solvents) like acetone, toluene, and gasoline; those containing chlorine in their chemical makeup and called chlorinated solvents like methylenechloride and trichloroethylene.

Solvents can enter into your body in two ways, by inhalation or by absorption through the skin. Any solvent inhaled may cause dizziness or headaches as it affects the central nervous system. If breathing solvent vapors continues over time, the development of nose, throat, eye and lung irritation and even damage to the liver, blood, kidneys, and digestive system may result. Most solvents in contact with skin can be absorbed into the body. Because solvents dissolve oils and greases, contact with skin can also dry it out, producing irritation, cracking, and skin rashes. Once a solvent penetrates through the skin, it enters into the bloodstream and can attack the central nervous system or other body organs.

Like all chemicals, the effect on the body will depend on a number of factors: toxicity, length of exposure, the body's sensitivity, and concentration or strength. Solvent hazards may be minimized by following a few simple rules:

- Know what chemicals you are working with.
- Use protective equipment such as gloves, safety glasses, and proper respirators to prevent contact with skin, eyes, and lungs.
- Make sure the work area has plenty of fresh air.
- Avoid skin contact with solvents.
- Wash with plenty of soap and water if contact with skin occurs.
- If a solvent splashes into eyes, flush with running water for a minimum of 15 minutes and get medical help. Remember, gasoline should never be used as a solvent or cleaning agent.

Cleaners

Cleaners contain acids, alkalines, aromatics, surfactants, petroleum products, ammonia, and hypochlorite. Because of these ingredients, cleaners are considered to be irritants and can be harmful if swallowed or inhaled. Many can cause eye, nose, throat, skin, and lung irritation. Some cleaners are flammable and burn easily. Others may be caustic or corrosive and cause severe skin damage. Because many cleaners used in industrial situations are consumer products commonly found in our homes, you may underestimate the hazard they pose. Close review of precautions

listed in the MSDS is needed to protect workers from these chemicals. Often, gloves and eye protection are required. Respirators may be needed to avoid inhaling the vapors and mists. The lack of worker personal hygiene is one of the greatest exposure problems. Hands and face should be washed thoroughly before eating, drinking, or smoking.

Mixing of cleaning chemicals should be avoided unless specifically instructed to do so. For example, a dangerous gas, chlorine, will be created if you mix bleach and ammonia or bleach and drain cleaner together. Because of the variety of cleaning materials in use, there are many signs and symptoms of overexposure. Those using cleaners should rely on the MSDS for the particular product being used.

Acids and Bases

Acids and bases (caustics) can easily damage the skin and eyes. How serious the damage is depends on how strong the chemical is, how long contact is maintained, and what actions are taken after an exposure. Acids and bases can be in the form of liquids, solid granules, powders, vapors, and gases. A few commonly used acids include sulfuric acid, hydrochloric acid, muriatic acid, and nitric acid. Some common bases (caustics) are lye (sodium hydroxide) and potash (potassium hydroxide). Both acids and bases can be corrosive, causing damage to whatever they come in contact with. The more concentrated the chemical, the more dangerous it can be. Vinegar is a mild form of acetic acid and as such it can be swallowed or rubbed on the skin with no damage, but a concentrated solution of acetic acid can cause serious burns.

Various acids react differently when they contact the skin. Sulfuric acid mixes with water to produce heat, so when it contacts the skin it reacts with moisture and causes burns. Hydrofluoric acid may not even be noticed if it spills on the skin, but hours later as the acid is absorbed into the muscle tissue it can cause deep burns that are very painful and take a long time to heal. When breathed, most acids in gas or vapor form react with the moisture in the nose and throat causing irritation or damage. Acetic and nitric acids do not react as readily with water, but when these vapors are inhaled they quickly penetrate into the lungs causing serious damage.

Bases, as a class of chemicals, feel slippery or soapy. In fact, soap is made from a mixture of a base (lye) and animal fat. Concentrated bases dissolve tissue easily and therefore can cause severe skin damage on contact. Concentrated caustic gases such as ammonia vapors can damage the skin, eyes, nose, mouth, and lungs. Even dry powder forms of bases can damage tissue when breathed because they react with the moisture in your skin, eyes and respiratory tract. Cement and mortar are alkali compounds in their wet or dry form. As dust and powder they can cause damage to the skin and eyes when they react with moisture in the body.

Concrete and mortar can also cause an allergic reaction in people who become sensitive to them. Contractors should follow these rules when working with acids and bases:

- Know what chemicals you are working with and how strong (concentrated) they are.
- Use personal protective equipment as noted on the MSDS.
- In case of skin or eye contact, flush with cool water for at least 15 minutes but do not rub the skin or eyes.

- Always add acid to the water to prevent splatter.
- Keep acids and bases apart, store separately and clean spills promptly. Acid and bases react, often violently, when mixed together.

Adhesives and Sealants

Most adhesives and sealants have some type of hazard warning on the label. Because of their common usage at home and on the job, these warnings are sometimes taken lightly or ignored altogether. Many adhesives and sealants are toxic because of their chemically reactive ingredients, or because of the solvent base that permits them to be applied more easily.

Adhesives or sealants that contain solvents may be flammable. Other types of adhesives, such as wood glue, may be eye and skin irritants. When working with any glue, care should be taken to avoid eye and skin contact. If the label indicates the adhesive is flammable, use and store away from sources of ignition. Epoxies contain epoxy amine resins and polyamide hardeners, which cause skin sensitization and respiratory tract irritation. Overexposure to epoxies can result in dizziness, drowsiness, nausea, and vomiting. In instances of extreme or prolonged exposure, kidney and liver damage may occur.

Floor adhesives may contain acrylics that can be irritating to the skin, may cause nausea, vomiting, headache, weakness, asphyxia, and death. Other adhesives or sealants may contain coal tar derivatives that are suspected carcinogens. Prolonged breathing of vapors and skin contact should be avoided.

Fuels

The primary hazard posed by fuels is, obviously, fire. Fuels are either flammable or combustible. Whether flammable (a material that easily ignites and burns with a vapor pressure below 100°F) or combustible (a material that ignites with a vapor pressure over 100°F), they should be handled with care. Gasoline is a flammable liquid and diesel fuel is an example of a combustible liquid.

Proper storage and transport of fuels in approved, self-closing, safety containers is extremely important and should be strictly adhered to at all times. When filling portable containers with flammable materials proper grounding and bonding is a must to prevent ignition caused by static electricity. Store gasoline in containers marked or labeled “gasoline.” Store kerosene in containers marked “kerosene.” Never use kerosene containers for the transport or storage of gasoline.

Excessive skin contact with fuels can result in dermatitis. Fuels entering the body through the skin and over a long period of time can break down the fatty tissues and possibly build up in the body. Excessive inhalation of fuels may cause central nervous system depression and aggravation of any existing respiratory disease. Leukemia is a potential side-effect of chronic exposure to some fuels and may lead to death. Ingestion of fuels may cause poisoning and possibly lung damage if aspirated into the lungs when ingested. Short exposures to fuel may cause skin, lung, and respiratory tract irritation.

When using portable containers for flammable liquids, spark-arrestors must be in place. When dispensing or using fuels, be aware of the location of fire extinguishers, fire alarms, and evacuation procedures. Fuels are flammable, so do not

store, use, or dispense near arc welding or open flame. Use a bonding clamp to bond and ground containers when dispensing fuels. Remember, if there is a spill of fuel the vapors may travel some distance to an ignition source resulting in fire or an explosion. Do not pour waste fuel and flammable liquids down the drain.

Consult an MSDS for proper waste disposal procedures. Specific emergency procedures will be detailed on the MSDS. In general, if a fuel gets into eyes, flush the affected eye with running water for at least 15 minutes, then seek medical attention. If it gets on the skin, wash the area of contact with soap and water (see Figure 14-2).



Figure 14-2. At times chemical showers should be a part of chemical safety for workers.

INFORMING WORKERS

The hazard communication standard is one of the most often cited standards by OSHA. It is found in 29 CFR 1910.1200 and 29 CFR 1926.59 and delineates that each employer is responsible to provide employees with training and information regarding the chemicals in their workplace and the hazards of potential exposure of chemical used in the workplace. The basic goal of a hazard communication program is to be sure employers and employees know about work hazards and how to protect themselves; this should help to reduce the incidence of chemical source illness and injuries.

OSHA has estimated that more than 32 million workers are exposed to 650,000 hazardous chemical products in more than 3 million American workplaces. This poses a serious problem for exposed workers and their employers.

Chemicals pose a wide range of health hazards (such as irritation, sensitization, and carcinogenicity) and physical hazards (such as flammability, corrosion, and reactivity). OSHA's Hazard Communication Standard (HCS) is designed to ensure that information about these hazards and associated protective measures is disseminated to workers and employers. This is accomplished by requiring chemical manufacturers and importers to evaluate the hazards of the chemicals they produce or import, and to provide information about them through labels on shipped containers and more detailed MSDSs. All employers with hazardous chemicals in their work-

places must prepare and implement a written hazard communication program and must ensure that all containers are labeled, employees are provided access to MSDSs, and an effective training program is conducted for all potentially exposed employees.

The HCS provides workers the right to know the hazards and identities of the chemicals they are exposed to in the workplace. When workers have this information they can effectively participate in their employers' protective programs and take steps to protect themselves. In addition, the standard gives employers the information they need to design and implement an effective protective program for employees potentially exposed to hazardous chemicals. Together these actions will result in a reduction of chemical source illnesses and injuries in American workplaces.

Protection under OSHA's HCS includes all workers exposed to hazardous chemicals in all industrial sectors. This standard is based on a simple concept: that employees have both a need and a right to know the hazards and the identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring.

The HCS covers both physical hazards (such as flammability or the potential for explosions) and health hazards (including both acute and chronic effects). By making information available to employers and employees about these hazards and recommended precautions for safe use, proper implementation of the HCS will result in a reduction of illnesses and injuries caused by chemicals. Employers will have the information they need to design an appropriate protective program. Employees will be better able to participate in these programs effectively when they understand the hazards involved, and to take steps to protect themselves. Together, these employer and employee actions will prevent the occurrence of adverse effects caused by the use of chemicals in the workplace.

The HCS established uniform requirements to make sure that the hazards of all chemicals imported into, produced, or used in U.S. workplaces are evaluated and that this hazard information is transmitted to affected employers and exposed employees.

Chemical manufacturers and importers must convey the hazard information they learn from their evaluations to downstream employers by means of labels on containers and MSDSs. In addition, all covered employers must have a hazard communication program to get this information to their employees through labels on containers, MSDSs, and training.

This program ensures that all employers receive the information they need to inform and train their employees properly and to design and put in place employee protection programs. It also provides necessary hazard information to employees so they can participate in, and support, the protective measures in place at their workplaces.

All employers, in addition to those in manufacturing and importing, are responsible for informing and training workers about the hazards in their workplaces, retaining warning labels, and making available MSDSs with hazardous chemicals.

Some employees deal with chemicals in sealed containers under normal conditions of use (such as in the retail trades, warehousing and truck and marine cargo handling). Employers of these employees must assure that labels affixed to incoming containers of hazardous chemicals are kept in place. They must maintain and provide access to MSDSs received or obtain MSDSs if requested by an employee. And they must train workers on what to do in the event of a spill or leak. However, written hazard communication programs will not be required for this type of operation.

All workplaces where employees are exposed to hazardous chemicals must have a written plan that describes how the standard will be implemented in that facility. The only work operations that do not have to comply with the written plan requirements are laboratories and work operations where employees handle chemicals only in sealed containers.

The written program must reflect what employees are doing in a particular workplace. For example, the written plan must list the chemicals present at the site, indicate who is responsible for the various aspects of the program in that facility and where written materials will be made available to employees.

The written program must describe how the requirements for labels and other forms of warning, MSDS and employee information and training are going to be met in the facility.

The HCS is based on a simple concept—that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring. The requirements for employers include the following:

- Becoming familiar with the rule.
- Identifying responsible staff.
- Identifying and generating a list of all hazardous chemicals in the workplace.
- Having a labeling system.
- Having copies of material safety data sheets (MSDSs).
- Providing employee information and training.

SUMMARY

It is important to take chemical safety serious. A chemical incident could cause an entire office building to be evacuated, with many ill or injured workers and possibly contaminated beyond use again. This could be a devastating economic and human loss. Chemicals are useful in getting the work done, but only if they can be used in a manner that will not cause undue problems or result in hazardous situations.

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CHAPTER 15

OFFICE BUILDING HEALTH ISSUES

Office health issues are often closely aligned with indoor air quality issues. A discussion of indoor air quality (IAQ) is found in Chapter 13, but some of the factors related to IAQ are helpful in understanding the effects on workers. A discussion of the factors related to sick building syndrome and building-related illnesses is an integral part of detection and prevention of their occurrence. Many factors can affect the wellness of workers within an office building.

HEALTH HAZARDS

Health hazards in the office environment must be identified (recognized), evaluated, and controlled in order to prevent occupational illnesses that come from exposure to them. Health hazards come in a variety of forms, such as chemical, physical, ergonomic, or biological:

- Chemical hazards arise from excessive airborne concentrations of mists, vapors, gases, or solids that are in the form of dusts or fumes. In addition to the hazard of inhalation, many of these materials may act as skin irritants or may be toxic by absorption through the skin. Chemicals can also be ingested although this is not usually the principle route of entry into the body.
- Physical hazards include excessive levels of nonionizing and ionizing radiations, noise, vibration, and extremes of temperature and pressure.
- Ergonomic hazards include improperly designed tools or work areas. Improper lifting or reaching, poor visual conditions, or repeated motions in an awkward position can result in accidents or illnesses in the occupational environment. Designing the tools and the job to be done to fit the worker should be of prime importance. Intelligent application of engineering and biomechanical principles is required to eliminate hazards of this kind.

- Biological hazards include insects, molds, fungi, viruses, vermin (birds, rats, mice, etc.) and bacterial contaminants (sanitation and housekeeping items such as potable water, removal of industrial waste and sewage, food handling, and personal cleanliness can contribute to the effects from biological hazards). Biological and chemical hazards can overlap.

These health-related hazards can often be difficult and allusive to identify. A common example of this is a contaminant that has caused symptoms of illness in an office building. Even the evaluation process may not be able to detect the contaminant that has dissipated before a sample can be collected. This leaves nothing to control and possibly no answer to what caused the illnesses.

You might want to know the most common reported illnesses in all workplaces. This can also assist you when you are deciding where to put your resources toward prevention of occupational illnesses in your facility or worksite. In Figure 15-1 you can find a listing of the most commonly reported occupational illnesses. The cost in compensation dollars should also make you look carefully at the types of illnesses that are most costly and yet are preventable. Most employers look at trauma injuries only and seldom pay attention to the potential cost of occupationally related illness.

Reported Nonfatal Occupational Illnesses	
Type of Illness	Percent of Total Illnesses Reported
Disorder associated with repeat trauma	62%
Skin disease or disorders	14%
Disease due to physical agents	5%
Respiratory conditions due to toxic agents	5%
Poisoning	2%
Dust diseases of the lungs	1%
All other diseases	12%

Figure 15-1. Percent of illness reported 1992 through 1994. (Information from Bureau of Labor Statistics Annual Report.)

As can be seen repeat trauma illnesses (ergonomic-related incidents) are most prevalent in the workplace today. These types of illnesses often go unreported until they have reached a serious level of impairment. The medical cost and lost-work time can be very large. This is why a specific chapter is reserved for ergonomics (Chapter 12).

Most skin disorders can be prevented with the proper use of personal protective equipment (PPE) and good personal hygiene (washing hands, etc.). Usually skin disorders are caused by exposure to chemicals and result in nothing more than a rash that is cured by proper PPE, removal, or substitution with a safer chemical. Some skin disorders can escalate into serious conditions when not tended to. At times a worker's skin disorder may be an allergic reaction that may not be solvable unless the worker is removed from that type of work. If the worker continues to do the same work this could result in a costly illness.

Physical agents, of which noise is the most common, in the workplace can lead to nonreparable hearing loss which becomes very compensable and degrades the value of that employee to you since he/she may not be able to hear warning signals or cannot communicate effectively with other workers. Although radiation, both ionizing (smoke detectors) and nonionizing (microwaves), can be found in the office workplace, it is not as common as noise, vibration, or temperature extremes.

What seem to present the most problems within the workplace are chemicals and the effects upon workers who are exposed to them. Thus, you will note the emphasis in that direction in Chapter 14. The major OSHA general chemical standards that impacts most workplaces are discussed in Chapter 14. The primary standard is the Hazard Communication Standard.

When complaints related to health occur in your office building, you might want to conduct a survey of workers in an attempt to identify the cause or causes for the complaints. This will allow you to better address the complaints in trying to find interventions or controls. An example of a worker health survey is found in Figure 15-2. Also see Figure 15-3.

OFFICE WORKERS' HEALTH SURVEY

Some of the people working in this office building have registered health complaints. To help investigate the cause of these complaints, this questionnaire is being distributed to all employees to gather information to help find solutions to these complaints. Your assistance is requested. Thank you for your time and attention to this survey.

COMPLAINTS:

Check the complaints below that you feel may relate to your working in this building. This is a comprehensive list and not all complaints listed have been noted in this building.

- ☐ Aching joints
- ☐ Muscle twitching
- ☐ Back pain
- ☐ Hearing disturbances
- ☐ Dizziness
- ☐ Dry, flaky skin
- ☐ Discolored skin
- ☐ Skin irritation/itching
- ☐ Heartburn

- ☐ Nausea
- ☐ Odors in building
- ☐ Sinus congestion
- ☐ Sneezing
- ☐ Tightness in chest
- ☐ Eye irritation
- ☐ Problems with contact lenses
- ☐ Headache
- ☐ Fatigue/drowsiness
- ☐ Temperature—too hot
- ☐ Temperature—too cold
- ☐ Other (please specify)

WHEN DO THESE PROBLEMS OCCUR? _____

WHEN DO YOU EXPERIENCE RELIEF FROM THESE COMPLAINTS?

DO YOU HAVE ANY OF THE FOLLOWING?

- ☐ Allergy to pollen
- ☐ Allergies
- ☐ Skin allergies
- ☐ Dermatitis
- ☐ Sinus problems
- ☐ Cold/flu
- ☐ Other allergies (please specify)

DO YOU SMOKE TOBACCO?

☐ No ☐ Yes:

AMOUNT OR FREQUENCY: _____

ON WHAT FLOOR OF THE BUILDING ARE YOU LOCATED?

IN WHAT DEPARTMENT OR AREA?

ARE YOU NEAR ANY OFFICE EQUIPMENT? IF SO, PLEASE SPECIFY.

ADDITIONAL COMMENTS OR OBSERVATIONS _____

TODAY’S DATE: _____

YOUR NAME (Optional): _____

Figure 15-2. Office workers’ health survey.



Figure 15-3. Most if not all office buildings are smoke-free environments, primarily for health reasons. Smokers are relegated to outside areas set aside for them such as pictured.

HEALTH AND IAQ

Most indoor air quality (IAQ) complaints are real to the occupant, may disappear after leaving the building, may affect certain areas/individuals, generally are non-specific, reduce worker efficiency and morale, and may lead to absenteeism. IAQ is not an exact science. There is no baseline for exposure limits. Results of evaluations or investigation may be inconclusive since it is difficult to link health effects to exposures. Indoor environments are a complex array of air pollutants with great variability in the response of individual workers. Symptoms related to IAQ are:

- Eye irritation.
- Coughing.
- Sneezing.
- Burning throat.

- Headaches.
- Dizziness.
- Nausea.
- Fatigue.
- Shortness of breath.
- Contact lens irritation.
- Other physical/psychological stresses.

Most often IAQ concerns exist in buildings with tighter building construction for energy efficiency, reduced levels of outdoor air provided to building interior, new building materials (insulation, foams, glues, particle board, fibrous glass), and increase worker awareness and concerns.

SICK BUILDING SYNDROME

Sick building syndrome (SBS) in an office building is said to exist when a substantial number of building occupants experience health and comfort problems. The cause of the symptoms is usually unknown but is similar to the experience with IAQ episodes. The symptoms usually cover a wide range from throat irritation to lethargy. In most cases there is no specific indoor pollutant that can be identified as causing the symptoms. Most of the time the symptoms lessen when leaving the building. Thus for SBS the common patterns are:

- Symptoms are mostly non-specific.
- Buildings are energy efficient.
- Forced air ventilation is common.
- Employees feel they have little control over their environment.
- More complaints exist where population densities are higher.
- Symptoms are more likely to occur in the afternoon.

Some of what can be done to mitigate SBS is to:

- Increase the fresh air.
- Ensure the ventilation system is well maintained and operating properly.
- Prevent disruption of circulation in occupied spaces.
- Maintain acceptable temperature and humidity levels.
- Be aware of possible indoor air contaminants and take steps to prevent their release.

INDOOR AIR CONTAMINANTS

There is a variety of indoor air contaminants that need to be addressed since they have the potential to cause illnesses. These contaminants are:

- Chemical pollutants—Volatile organic compounds (e.g., adhesives, paints, waxes, printing, solvents, perfumes, etc.)
- Inorganic gases—carbon monoxide, nitrogen oxides, or ozone.
- Particulate matter—asbestos fiber, carbon black dust, etc.
- Biological pollutants—bacteria, virus, fungi, molds, vermin, etc.
- Motor vehicle exhaust.
- Boiler emissions.
- Exhausted air.
- Construction activities (see Chapter 22)—construction dust, roofing materials, etc.
- Gasoline spills.
- Uptake of plumes from other buildings or manufacturing facilities.
- Pollen and fungi.
- Cleaning products.
- Emission from office equipment and copiers.
- Insect control pesticides.
- New carpet and furnishings.

BUILDING-RELATED ILLNESS (BRI)

Building-related illnesses are more serious than SBS and can be identified by clinical testing. Symptoms may be similar to SBS but the symptoms of BRI do not resolve easily. They are caused by microbial contamination and/or specific chemical exposures that can result in allergic and/or infectious responses. In BRI there is a clear-cut relationship between symptoms and exposure to one or more infective, toxic or immunological agents that trigger or exacerbate the disease. Such building-related diseases are:

- Allergic respiratory disease—Sinusitis, pharyngitis, asthma, hypersensitivity pneumonitis, humidifier fever.
- Mucous membrane—Irritation.
- Infectious diseases—Legionnaires's disease, Pontiac fever, Q fever
- Dermatitis—Allergic and irritant.
- Miscellaneous—Mass psychogenic illness, environmental illness, carbon monoxide poisoning.

Some of the more common biological contaminants that have been linked to related office diseases are as follows:

- Fungi—*Aspergillus* and *Stachybotrys*.
- Bacterial—*Legionella pneumophila*.
- Virus—Influenza and common cold.

- Microbial toxins—Endotoxins and mycotoxins.
- Pollen—Ragweed.
- Animal dander—Animal skin, hair, and scales.
- Insects—Droppings and body fragments.
- Rodents—Droppings and Bubonic plague.
- Birds—Pigeon droppings/Ornithosis.

An action that can be undertaken to prevent BRI is to prevent water and moisture from entering the building from leaks, high relative humidity, floods, spills, groundwater penetration, and wet construction materials. The places that microorganisms tend to grow in a building are:

- In water-damaged ceiling tiles (see Figure 15-4).
- In sheetrock.
- On wall coverings.
- On and in wood.
- In carpeting.
- Soiled insulation.

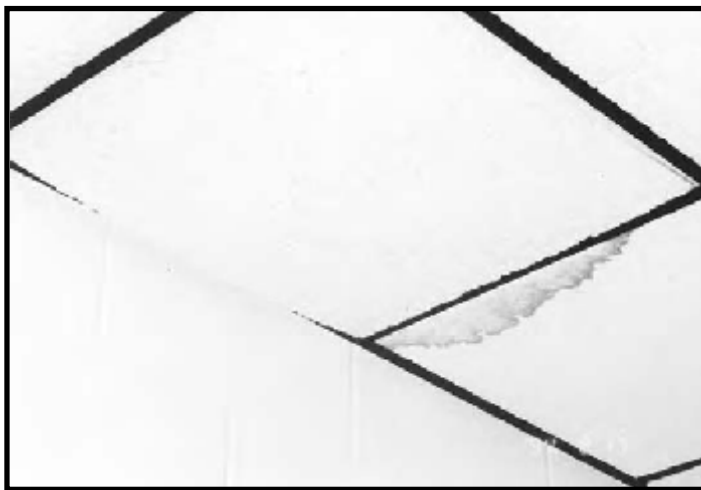


Figure 15-4. Damaged and discolored ceiling tiles.

Note: Water-damaged materials can support microbial growth long after they appear dry. Microbial growth takes a nutrient source, water, and temperature (40–100°F). Office buildings often can provide all the staples for growth.

CONTROLLING BIOLOGICALS

In an attempt to control biological organisms that can be dispersed throughout the office building you should:

- Promptly detect and repair sources of water incursion into the building.
- Check the location of air intakes (intakes below grade may contain leaves and dirt).
- Provide adequate fresh air to dilute biological organisms suspended in the air.
- Provide good air filtration: 50–70 percent efficiency rating to remove fungal/bacteria spores.
- Maintain relative humidity below 60 percent.
- Remove and discard porous contaminated materials.
- Clean and disinfect non-porous materials with soap and water.

SPECIAL HEALTH ISSUES

Unique health issues such as bioterrorism will not be discussed in this chapter since these are special situations that take special procedures. The concepts for addressing these types of health issues will be reserved for Chapter 24 where nuclear, biological and chemical weapons are discussed.

SUMMARY

Illnesses linked to exposures in the office work environment are difficult to diagnose. Even if the illness is suspected to be caused by something within the office building, it is very difficult to obtain a sample in large enough quantities to suggest any contaminate found is the culprit. This is because of the constant circulation and change of air that is occurring due to the HVAC system. Many times only one or a few individuals suffer from the disease and thus it is not of epidemic proportions to indicate that something in the office building is really the cause of the symptoms. It is not a suggestion that office-related illnesses be dismissed as psychosomatic. Since it has been realized that some workers definitely are suffering from the office environment, better understanding, research, and data need to be gathered so that the link to a disease can be identified and controlled.

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CHAPTER 16

OFFICE BUILDING EMERGENCIES



Is this office building prepared for an emergency?

It is important to anticipate the unexpected. Granted you cannot be ensured that you will be able to prevent the damage or disasters from occurring. Nobody expects an emergency or disaster—especially one that affects them, their employees, and their business personally. Yet the simple truth is that emergencies and disasters can strike anyone, anytime, and anywhere. You and your employees could be forced to evacuate your office building when you least expect it.

The best way to protect yourself, your workers, and your business is to expect the unexpected and develop a well-thought-out emergency action plan to guide you when immediate action is necessary.

A workplace emergency is an unforeseen situation that threatens your employees, customers, or the public, disrupts or shuts down your operations or causes physical or environmental damage. Emergencies may be natural or man-made and include the following:

- Floods.
- Hurricanes.
- Tornado or high winds.
- Fires.
- Toxic gas releases.
- Chemical spills.
- Radiological accidents.
- Explosions.
- Bomb threats.
- Terrorist activities.
- Medical emergencies.
- Civil disturbances.
- Workplace violence resulting in bodily harm and trauma.

The best way is to prepare to respond to an emergency before it happens. Few people can think clearly and logically in a crisis, so it is important to do so in advance, when you have time to be thorough.

Brainstorm the worst-case scenarios. Ask yourself what you would do if the worst happened. What if a fire broke out in your boiler room? Or a hurricane hit your building head-on? Or a train carrying hazardous waste derailed while passing your loading dock? Once you have identified potential emergencies, consider how they would affect you and your workers and how you would respond.

EMERGENCY ACTION PLAN

An emergency action plan covers designated actions employers and employees must take to ensure employee safety from fire and other emergencies. Not all employers are required to establish an emergency action plan. See Figure 16-1 to determine if you are required to do so. Even if you are not specifically required to do so, compiling an emergency action plan is a good way to protect yourself, your employees, and your business during an emergency.

Putting together a comprehensive emergency action plan that deals with all types of issues specific to your worksite is not difficult. You may find it beneficial to include your management team and employees in the process. Explain your goal of protecting lives and property in the event of an emergency, and ask for their help in establishing and implementing your emergency action plan. Their commitment and support are critical to the plan's success.

When developing your emergency action plan, it's a good idea to look at a wide variety of potential emergencies that could occur in your workplace. It should be tailored to your worksite and include information about all potential sources of emergencies.

Developing an emergency action plan means you should do a hazard assessment to determine what, if any, physical or chemical hazards in your workplaces could cause an emergency. If you have more than one worksite, each site should have

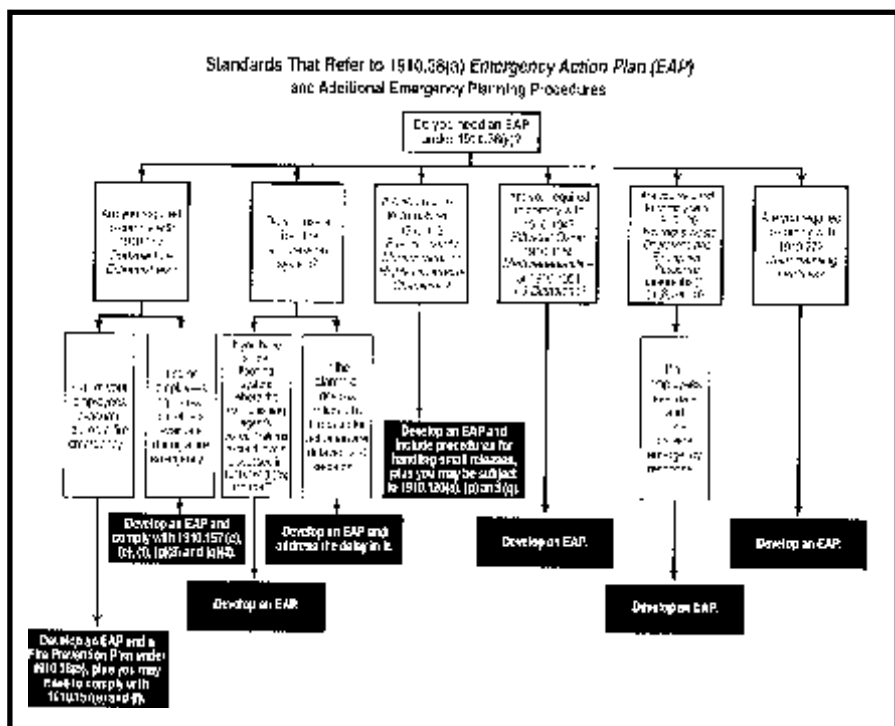


Figure 16-1. Determining if you need an EAP. (Courtesy of the Occupational Safety and Health Administration.)

an emergency action plan. At a minimum, your emergency action plan must include the following:

- A preferred method for reporting fires and other emergencies.
- An evacuation policy and procedure.
- Emergency escape procedures and route assignments, such as floor plans, workplace maps, and safe or refuge areas.
- A designated assembly location and procedures to account for all employees after evacuation.
- Names, titles, departments, and telephone numbers of individuals both within and outside your company to contact for additional information or explanation of duties and responsibilities under the emergency plan.
- Procedures for employees who remain to perform or shut down critical plant operations, operate fire extinguishers, or perform other essential services that cannot be shut down for every emergency alarm before evacuating.
- Rescue and medical duties for any workers designated to perform them.

Although they are not specifically required by OSHA, you may find it helpful to include in your plan the following:

- The site of an alternative communications center to be used in the event of a fire or explosion.
- A secure on- or off-site location to store originals or duplicate copies of accounting records, legal documents, your employees' emergency contact lists, and other essential records.

ALARM SYSTEMS

Your plan must include a way to alert employees, including disabled workers, to evacuate or take other action, and to report emergencies, as required. Among the steps you must take are the following:

- Make sure alarms are distinctive and recognized by all employees as a signal to evacuate the work area or perform actions identified in your plan.
- Make available an emergency communications system such as a public address system, portable radio unit, or other means to notify employees of the emergency and to contact local law enforcement, the fire department, and others.
- Stipulate that alarms must be able to be heard, seen, or otherwise perceived by everyone in the workplace. You might want to consider providing an auxiliary power supply in the event that electricity is shut off. (29 CFR 1910.165(b)(2) offers more information on alarms.)

Although it is not specifically required by OSHA, you also may want to consider the following:

- Using tactile devices to alert employees who would not otherwise be able to recognize an audible or visual alarm (see Figure 16-2); and
- Providing an updated list of key personnel such as the plant manager or physician, in order of priority, to notify in the event of an emergency during off-duty hours.



Figure 16-2. An alarm that is both auditory and visual (strobe light).

EVACUATION

A disorganized evacuation can result in confusion, injury, and property damage. That is why when developing your emergency action plan it is important to determine the following:

- Conditions under which an evacuation would be necessary.
- A clear chain of command and designation of the person in your business authorized to order an evacuation or shutdown. You may want to designate an “evacuation warden” to assist others in an evacuation and to account for personnel.
- Specific evacuation procedures, including routes and exits. Post these procedures where they are easily accessible to all employees. Figure 16-3 is an example of an evacuation map for an office floor.

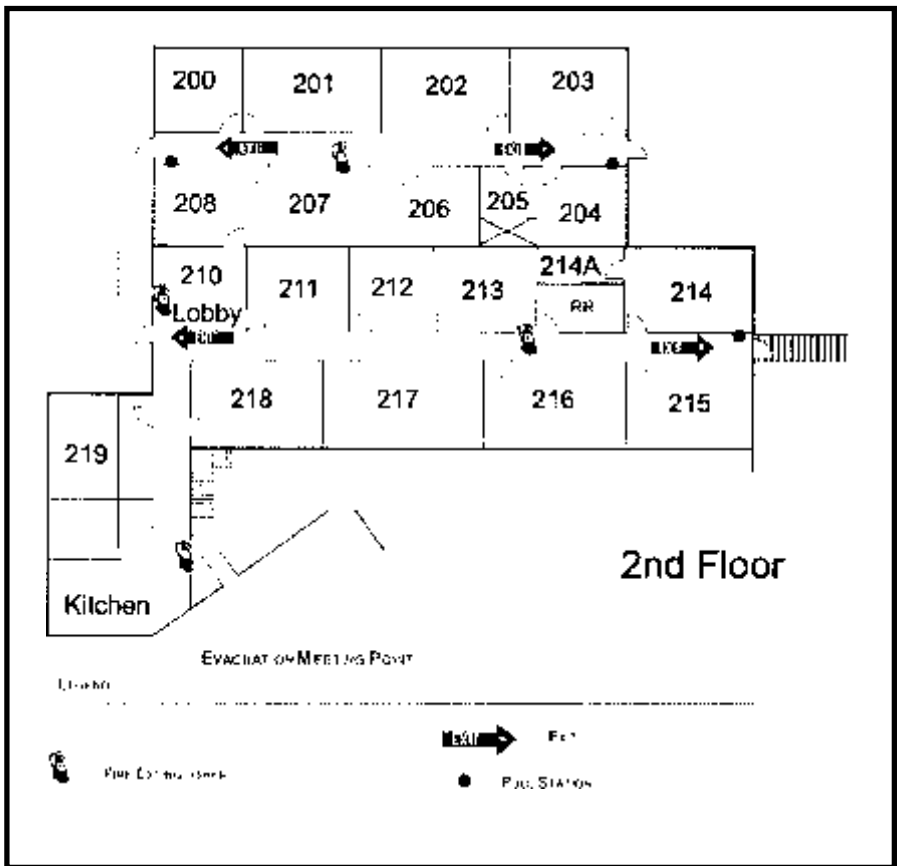


Figure 16-3. Sample evacuation map. (Courtesy of the Los Alamos National Laboratories.)

- Procedures for assisting people with disabilities or who do not speak English.
- Designation of which, if any, employees will continue or shut down critical operations during an evacuation. These people must be capable of recognizing when to abandon the operation and evacuate themselves.
- A system for accounting for personnel following an evacuation. Consider employees' transportation needs for community-wide evacuation.

In the event of an emergency, local emergency officials may order you to evacuate your premises. In some cases, they may instruct you to shut off the water, gas, and electricity. If you have access to radio or television, listen to newscasts to keep informed and follow whatever official orders you receive.

In other cases, a designated person within your business should be responsible for making the decision to evacuate or shut down operations. Protecting the health and safety of everyone in the facility should be the first priority. In the event of a fire, an immediate evacuation to a predetermined area away from the facility is the best way to protect employees. On the other hand, evacuating employees may not be the best response to an emergency such as a toxic gas release at a facility across town from your business.

The type of office building you work in may be a factor in your decision. Most buildings are vulnerable to the effects of disasters such as tornadoes, earthquakes, floods, or explosions. The extent of the damage depends on the type of emergency and the building's construction. Modern office buildings, for example, are framed in steel and are structurally more sound than neighborhood business premises may be. In a disaster such as a major earthquake or explosion, however, nearly every type of structure will be affected. Some buildings will collapse and others will be left with weakened floors and walls.

EXIT ROUTES

Having adequate and properly designed exit routes is critical for office buildings. Exit routes can follow the National Fire Protection Associations' Life Safety Code NFPA 101-2000 instead of the OSHA standard for exit routes. The following highlights the requirements for exit routes:

- An exit route must be a permanent part of the workplace.
- An exit route must be separated from other parts of the workplace by fire resistant materials.
- Opening into an exit must be limited and guarded by a self-closing door.
- The number of exits must be adequate and at least two exit routes must be available in case one is blocked.
- More than two exits must be available if the number of employees, size of building, or configuration of the workplace would not allow for safe evacuation.
- Under unusual circumstances where safe evacuation is possible a single exit route is permitted.

- Exits must discharge to the outside, street, walkway, refuge area, public way or open space with access to the outside and must accommodate the number of evacuees.
- Exit doors must be unlocked to allow evacuees to freely travel through (see Figure 16-4).
- Exit doors must be free of any device or alarm that could restrict emergency use of the exit route if such devices failed.
- All doors must be single hinged and must swing in the direction of exit travel.
- The capacity of an exit route must be adequate.
- An exit route must meet minimum standards for height (7 feet 6 inches) and width (28 inches) or sufficient to accommodate the maximum permitted occupant load of each floor.
- An outdoor exit route is permitted but must meet the following requirements:
 - The outdoor exit route must have guardrails to protect from fall hazards.
 - The outdoor exit route must be covered if snow or ice is likely to accumulate.
 - The outdoor exit route must be reasonably straight, smooth, and level.
 - The outdoor route must not have a dead-end that is longer than 20 feet.



Figure 16-4. Common or typical exit door with a panic bar.

ROLES OF RESPONSIBLE INDIVIDUALS

When drafting your emergency action plan, you may wish to select a responsible individual to lead and coordinate your emergency plan and evacuation. It is critical that employees know who the coordinator is and understand that person has the authority to make decisions during emergencies. The coordinator should be responsible for the following:

- Assessing the situation to determine whether an emergency exists requiring activation of your emergency procedures.
- Supervising all efforts in the area, including evacuating personnel.
- Coordinating outside emergency services, such as medical aid and local fire departments, and ensuring that they are available and notified when necessary.
- Directing the shutdown of plant operations when required.

You also may find it beneficial to coordinate the action plan with other employers when several employers share the worksite, although OSHA standards do not specifically require this.

In addition to a coordinator, you may want to designate evacuation wardens to help move employees from danger to safe areas during an emergency. Generally, one warden for every 20 employees should be adequate, and the appropriate number of wardens should be available at all times during working hours.

Employees designated to assist in emergency evacuation procedures should be trained in the complete workplace layout and various alternative escape routes. All employees and those designated to assist in emergencies should be made aware of employees with special needs who may require assistance, how to use the buddy system, and hazardous areas to avoid during an emergency evacuation.

Accounting for all employees following an evacuation is critical. Confusion in the assembly areas can lead to delays in rescuing anyone trapped in the building or unnecessary and dangerous search and rescue. To ensure the fastest, most accurate accountability of your employees, you may want to consider including these steps in your emergency action plan:

- Designate assembly areas where employees should gather after evacuating.
- Take a head count after evacuation. Identify the names and last known location of anyone not accounted for and pass this information to the official in charge.
- Establish a method for accounting for non-employees such as suppliers and customers.
- Establish procedures for further evacuation in case the incident expands. This may consist of sending employees home by normal means or providing them with transportation to an offsite location.

RESCUE OPERATIONS

It takes more than just willing hands to save lives. Untrained individuals

may endanger themselves and those they are trying to rescue. For this reason, it is generally wise to leave rescue work to those who are trained, equipped and certified to conduct rescues.

MEDICAL EMERGENCY CARE

If your office building does not have a formal medical program, you may want to investigate ways to provide medical and first aid services. If medical facilities are available near your worksite, you can make arrangements for them to handle emergency cases. Provide your employees with a written emergency medical procedure to minimize confusion during an emergency.

If an infirmary, clinic or hospital is not close to your workplace, ensure the onsite person(s) have adequate training in first aid. The American Red Cross, some insurance providers, local safety councils, fire departments or other resources may be able to provide training. Treatment of a serious injury should begin within three to four minutes of the accident.

Consult with a physician to order appropriate first-aid supplies for emergencies. Medical personnel must be accessible to provide advice and consultation in resolving health problems that occur in the workplace. Establish a relationship with a local ambulance service so transportation is readily available for emergencies.

ROLE OF EMPLOYEES

The best emergency action plans include employees in the planning process, specify what employees should do during an emergency, and ensure that employees receive proper training for emergencies. Include your employees in your planning and encourage suggestions about potential hazards, worst-case scenarios, and proper emergency responses. After you develop the plan, review it with your employees to make sure everyone knows what to do before, during and after an emergency. Hold meetings to review the procedures to see if they need to be updated.

Keep a copy of the emergency action plan in a convenient location where employees can get to it, or provide all employees a copy. If you have ten or fewer employees, you may communicate your plan orally.

In the event of an emergency it could be important to have ready access to important personal information about your employees. This includes their home telephone numbers, the names and telephone numbers of their next of kin, and medical information. You should store this information in a manner that protects your employees' privacy while providing easy access when the information is needed.

EMPLOYEE TRAINING

Educate your employees about the types of emergencies that may occur and train them in the proper course of action. The size of your workplace and workforce, processes used, materials handled, and the availability of onsite or outside resources will determine your training requirements. Be sure all your employees understand the function and elements of your emergency action plan, including types of potential emergen-

cies, reporting procedures, alarm systems, evacuation plans, and shutdown procedures. Discuss any special hazards you may have onsite such as flammable materials, toxic chemicals, radioactive sources, or water-reactive substances. Clearly communicate to your employees who will be in charge during an emergency to minimize confusion.

General training for your employees should address the following:

- Individual roles and responsibilities.
- Threats, hazards, and protective actions.
- Notification, warning, and communications procedures.
- Means for locating family members in an emergency.
- Emergency response procedures.
- Evacuation, shelter, and accountability procedures.
- Location and use of common emergency equipment.
- Emergency shutdown procedures.

You also may wish to train your employees in first-aid procedures, including protection against blood-borne pathogens; respiratory protection, including use of an escape-only respirator; and methods for preventing unauthorized access to the site.

Once you have reviewed your emergency action plan with your employees and everyone has had the proper training, it is a good idea to hold practice drills as often as necessary to keep employees prepared. Include outside resources such as fire and police departments when possible. After each drill, gather management and employees to evaluate the effectiveness of the drill. Identify the strengths and weaknesses of your plan and work to improve it.

Review your plan with all your employees and consider requiring annual training in the plan. Also offer training when you do the following:

- Develop your initial plan.
- Hire new employees.
- Introduce new equipment, materials or processes into the workplace if they affect evacuation routes.
- Change the layout or design of the facility.
- Revise or update your emergency procedures.

HAZARDOUS SUBSTANCE ISSUES

No matter what kind of business you run, you could potentially face an emergency involving hazardous materials such as flammable, explosive, toxic, noxious, corrosive, biological, oxidizing, or radioactive substances.

The source of the hazardous substances could be external, such as a local chemical plant that catches on fire or an oil truck that overturns on a nearby freeway. The source may be within your office building. Regardless of the source, these events could have a direct impact on your employees and your business and should be addressed by your emergency action plan.

If you use or store hazardous substances at your worksite, you face an in-

creased risk of an emergency involving hazardous materials and should address this possibility in your emergency action plan. OSHA's Hazard Communication Standard (29 CFR 1910.1200) requires employers who use hazardous chemicals to inventory them, keep the manufacturer-supplied material safety data sheets (MSDSs) for them in a place accessible to workers, label containers of these chemicals with their hazards, and train employees in ways to protect themselves against those hazards. A good way to start is to determine from your hazardous chemical inventory what hazardous chemicals you use and to gather the MSDSs for the chemicals. MSDSs describe the hazards that a chemical may present, list the precautions to take when handling, storing, or using the substance, and outline emergency and first-aid procedures.

For specific information on how to respond to emergencies involving hazardous materials and hazardous waste operations, refer to 29 CFR, Part 1910.120(q) and OSHA Publication 3114, Hazardous Waste and Emergency Response Operations. Both are available online at www.osha.gov.

PERSONAL PROTECTIVE EQUIPMENT

Some or maybe all of your employees may need personal protective equipment to evacuate during an emergency. Personal protective equipment (PPE) must be based on the potential hazards in the workplace. Assess your workplace to determine potential hazards and the appropriate controls and protective equipment for those hazards. Personal protective equipment may include items such as the following:

- Safety glasses, goggles, or face shields for eye protection.
- Hard hats and safety shoes for head and foot protection.
- Proper respirators.
- Chemical suits, gloves, hoods, and boots for body protection from chemicals.
- Special body protection for abnormal environmental conditions such as extreme temperatures.
- Any other special equipment or warning devices necessary for hazards unique to your worksite.

In Appendix G you will find an assessment instrument that can be used to evaluate when a piece of PPE is needed to protect the workers who are responding to an emergency within the office building.

Consult with health and safety professionals before making any purchases. The equipment selected should be appropriate to the hazards in your workplace, meet OSHA standards criteria, and be certified by the National Institute for Occupational Safety and Health.

Respiratory protection may be necessary if your employees must pass through toxic atmospheres of dust, mists, gases, or vapors, or through oxygen-deficient areas while evacuating. There are four basic categories of respirators for use in different conditions. All respirators must be NIOSH-certified under the current 29 CFR 1910.134. See also OSHA's Small Entity Compliance Guide for Respiratory Protection, 1999, online at www.osha.gov. You should have an industrial hygienist help you

select the proper respirator for the potential hazards that your employees will be exposed to.

Before assigning or using respiratory protection you must make sure the following conditions are met:

- Employees are physically able to use the respirator based on their medical evaluation.
- You have written procedures on the safe use, care, and maintenance of the equipment and that employees receive training in these areas.
- Employees receive a fit test to ensure proper fit of the equipment.
- Equipment is readily accessible to employees in emergencies.

Although there is no specific OSHA requirement to do so, you may find it useful to coordinate your efforts with any other companies or employee groups in your office building to ensure the effectiveness of your plan. In addition, if you rely on assistance from local emergency responders such as the fire department, local HAZMAT teams, or other outside responders, you may find it useful to coordinate your emergency plans with these organizations. This ensures that you are aware of the capabilities of these outside responders and that they know what you expect of them.

APPLICABLE REGULATIONS

Some of the key OSHA requirements for emergencies can be found in the following sections of the agency's General Industry Occupational Safety and Health Standards (29 CFR 1910). They are as follows:

Subpart E—Exit Routes, Emergency Action Plans, and Fire Prevention Plans

- | | |
|---------|--|
| 1910.35 | Compliance with NFPA 101-2000, Life Safety Code. |
| 1910.36 | Design and construction requirements for exit routes. |
| 1910.37 | Maintenance, safeguards, and operational features for exit routes. |
| 1910.38 | Employee emergency plans. |
| 1910.39 | Fire prevention plans. |

Subpart H—Hazardous Materials

- | | |
|----------|--|
| 1910.119 | Process safety management of highly hazardous chemicals. |
| 1910.120 | Hazardous waste operations and emergency response. |

Subpart I—Personal Protective Equipment

- | | |
|----------|-------------------------------|
| 1010.133 | Eye and face protection. |
| 1910.134 | Respiratory protection. |
| 1910.135 | Occupational head protection. |
| 1910.136 | Occupational foot protection. |
| 1910.138 | Hand protection. |

Subpart J—General Environmental Controls

- 1910.146 Permit-required confined spaces.
- 1910.147 Control of hazardous energy sources.

Subpart K—Medical and First Aid

- 1910.151 Medical services and first aid.

Subpart L—Fire Protection

- 1910.155-156 Fire protection and fire brigades.
- 1910.157-163 Fire suppression equipment.
- 1910.164 Fire detection systems.
- 1910.165 Employee alarm systems (Appendices A-E of Subpart L).

Subpart Z—Toxic and Hazardous Substances

- 1910.1030 Blood-borne pathogens.
- 1910.1200 Hazard communication.

OSHA COMPLIANCE

Is your office building in compliance with the OSHA regulations regarding emergency preparedness? The following page provides a compliance checklist that can be used to determine if you are in compliance with 29 CFR 1910.38 (see Figure 16-4).

SUMMARY

In preparing for the unexpected emergency or catastrophic event, you must be proactive in your approach and not assume that it will take care of itself. As a general recommendation, employers should develop an emergency action plan to address emergencies that the employer can expect in the workplace. Examples of such foreseeable emergencies are fire, toxic chemical releases, hurricanes, tornadoes, blizzards, and floods.

Some of the key components of an emergency action plan are the following:

- Emergency escape procedures and escape routes for employees to follow in the event of an emergency. They should include floor plans that indicate the appropriate evacuation routes (see Figure 16-5).
- How to account for all employees following evacuation.
- The rescue and medical duties for those employees, if any, who are to perform them.
- The preferred means of reporting fires and other emergencies.
- Names or regular job titles of persons responsible for the emergency action plan.

**CHECKLIST FOR EMERGENCY RESPONSE
PLAN COMPLIANCE**

- ☐ Yes ☐ No If the employer does not have an emergency response plan but has an emergency action plan, is the emergency plan adequate? (If not then, 29 CFR 1910.38(a) will be cited.)
- ☐ Yes ☐ No Is the emergency action plan in writing (may be communicated orally to employees by employers with 10 or fewer employees)? (If not then, 29 CFR 1910.38(b) will be cited.)
- ☐ Yes ☐ No Are emergency escape procedures and emergency routes designated? (If not then, 29 CFR 1910.38(c)(2) will be cited.)
- ☐ Yes ☐ No Are procedures established to account for all employees after the emergency evacuation has been completed? (If not then, 29 CFR 1910.38(c)(4) will be cited.)
- ☐ Yes ☐ No Has an employee alarm system which complies with 29 CFR 1910.165 been established? (If not then, 29 CFR 1910.38(d) will be cited.)
- ☐ Yes ☐ No If an employee alarm system is used for other purposes, have distinctive signals for each purpose been developed? (If not then, 29 CFR 1910.38(d) will be cited.)
- ☐ Yes ☐ No Has the employer designated and trained a sufficient number of persons to assist in the safe and orderly evacuation of employees (generally one per 20 employees)? (If not then, 29 CFR 1910.38(e) will be cited.)
- ☐ Yes ☐ No Has the employer reviewed the emergency action plan with each employee covered by the plan initially, and when the plan or the employee's responsibilities under the plan change? (If not then, 29 CFR 1910.38(f) will be cited.)
- ☐ Yes ☐ No Is the written plan kept at the workplace (may be communicated orally to employees by employers with 10 or fewer employees) and made available for employee review? (If not then, 29 CFR 1910.38(b) will be cited.)
- ☐ Yes ☐ No Has the plan been effectively communicated and implemented by employers and explained to employees who are not expected to assist in handling emergencies?
- ☐ Yes ☐ No Does the employer actually intend to have employees respond to emergencies?
- ☐ Yes ☐ No Does the employer intend to have employees handle incidental releases? If so, are the training, tools, equipment, and PPE appropriate for handling incidental releases of the hazardous substances available in the work area?
- ☐ Yes ☐ No Does the employer have procedures for notifying both inside and outside parties of incidents? Employees may be placed at risk in

situations where they are required by the plan to remain in a temporarily safe area to shut down an operation, and the plan does not have procedures for the employer to ensure that outside responders are notified in a timely manner. A close look at emergency action plans that do not have procedures for immediately contacting the local fire department and other outside parties should be evaluated in order to determine whether such plans place any workers at risk. "Outside parties" means: fire departments, police, private hazamat teams, emergency medical services personnel, pertinent components of the state and federal emergency response system and other employers in the surrounding area who could be affected by a hazardous substance emergency incident.

Figure 16-5. Checklist for emergency response plan compliance.

Sample Emergency Evacuation Plan

1. In the event of an emergency necessitating the evacuation of the office, facility areas or any portions thereof, the supervisor in charge will immediately make repeated announcements over the public address system that an emergency exists and that all personnel in the danger area will evacuate the building in an orderly manner.
2. As soon as an evacuation signal is given _____, _____, _____, or any and all supervisors will assume a station in the vicinity of the exit doors to receive reports regarding the completion of the evacuation of the building or buildings.
3. When orders are given to evacuate, all supervisors will render assistance to those persons evacuating the building and shall begin an immediate check of each room or office if at all possible to make sure that everyone has left the building.
4. After being assured that a building or work area has been completely evacuated the supervisor shall report the same to the manager.
 - a. If an evacuation occurs at night, the supervisor on duty will perform these assignments and at the first opportunity notify the manager.
 - b. Shop evacuation will be performed in essentially the same manner with one exception. This is, notification of personnel in the shop will be handled by voice. Shop forepersons or their assistants and or any employee day or night will declare an emergency and give the order to evacuate.
5. Emergency telephone number of the fire department, rescue, etc. are posted in the dispatch office, dock office, supervisor office, and other operating areas. **It is essential that the appropriate emergency service be called immediately.** If the emergency occurs dur-

ing office hours, the manager and/or shop foreperson will make the emergency telephone call. When an emergency exists after office hours, the supervisor in charge will make the call.

6. An emergency escape route chart will be posted in the office and basement.
7. Major workplace fire hazards and controls will be discussed with the local fire department authorities. This information along with the aforementioned procedure will be discussed with all personnel in the safety meeting.
8. Emergency escape procedures from the dock and shop will be verbally discussed with all workers and all new personnel prior to assignment.
9. These procedures will be revised when there are any physical changes to the facility or changes in evacuation personnel or evacuation routes.

Figure 16-6. A sample emergency evacuation plan. (Courtesy of the Occupational Safety and Health Administration.)

Employers are, however, required to have both an emergency action plan and a fire prevention plan when portable fire extinguishers are provided, even though they are not intended for employee use. The elements of a fire prevention plan are:

- Identification of the major workplace fire hazards and their proper handling and storage.
- Potential ignition sources (e.g., smoking) and their control procedures and the type of fire protection equipment or systems that can be used to control a fire.
- Names or regular job titles of personnel responsible for fire suppression equipment or systems.
- Names or regular job titles of personnel responsible for controlling fuel source hazards.

The local emergency action plan will address potential emergencies that can be expected in your work area. For emergency evacuation, the use of floor plans or workplace maps that clearly show the emergency escape routes and safe or refuge areas should be included in the plan. All employees must understand what actions they are to take in the work area and assemble in a safe zone. All new employees should discuss how they should respond to emergencies with their supervisors shortly after starting work and whenever their responsibilities under the plan change. This orientation should include:

- Identifying the individuals responsible for various aspects of the plan (chain of command) so that in an emergency confusion will be minimized and employees will have no doubt about who has authority for making decisions.
- Identifying the method of communication that will be used to alert employees that an evacuation or some other action is required as well as

how employees can report emergencies (such as manual pull stations, public address systems, or telephones).

- Identifying the evacuation routes from the building and locations where employees will gather.

Emergency action plans are designed to control events and minimize the effects. Through careful pre-planning, establishment of emergency action teams, training and drills, employees can be safeguarded and potential for damage to company assets minimized. Emergency action plans include:

- Exit routes, meeting areas and employee accounting.
- Emergency evacuation, incident command and notification to emergency services.
- Personal injury and property damage.
- Protection of company information, both hard copy and electronic media.
- Bomb threats and facility security.
- First aid response.
- Use of fire extinguishers.

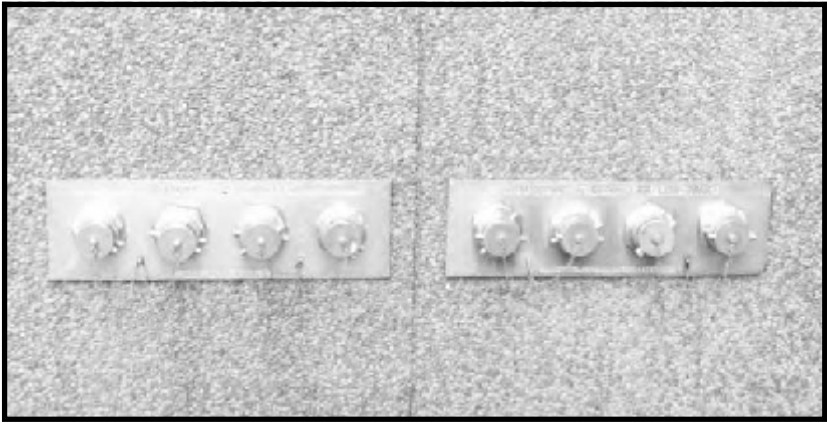
Emergency action team members (for example, supervisors, receptionist/telephone operators, and key assigned members) should be trained with quarterly reviews and drills. Semiannual drills with all employees should be conducted to assure effectiveness. First aid kits or first aid supplies should be available with trained first aid providers available.

REFERENCES

- North Carolina's Department of Labor. *A Guide to Office Safety and Health*. Raleigh: 1997.
- Reese, C.D., *Occupational Health and Safety: A Practical Approach*. CRC Press/Lewis Publishers, Roca Raton: 2003
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. *Occupational Health and Safety Manual*. Atlanta: 2002.
- U.S. Department of Labor: Occupational Safety and Health Administration. *How to Plan for Workplace Emergencies and Evacuations (OSHA 3088)*. Washington: 2001.
- U.S. Department of Labor. *Occupational Safety and Health Standards for General Industry (29 CFR 1910)*. Washington: 2003.

CHAPTER 17

OFFICE BUILDING FIRE PREVENTION



Standpipes on the outside of an office building are a ready source of water for the firefighters.

Every year there are about 7,000 fires that break out in high-rise office buildings causing deaths, injuries, and millions of dollars in fire damage. Most of these could be eliminated if everyone practiced good fire prevention on the job and planned ahead for a fire emergency.

In terms of fire safety, a high-rise building could be defined as a building taller than four stories or 75 feet since fire department aerial ladders rarely reach anything higher than that. The possibility of a fire deserves serious thought. In a high rise building it is especially important to know when and how to escape in case of fire.

MANAGING FIRE SAFETY

If you own, manage or employ workers in an office building, you should have the answers to these questions:

- Do you have a fire emergency plan?

- Has it been reviewed and approved by the fire department?
- Have tenants and employees been given instruction on the details of the plan?
- Can the building be evacuated to the street without interfering with fire department personnel?
- If the previous answer is no, are there areas of refuge in the building?
- Are there provisions for physically challenged people who may be in the building (see Figure 17-1)?



Figure 17-1. Area of rescue for those with disabilities.

- If a fire starts, will it be detected promptly? How?
- Will the fire department be notified promptly? How?
- Is there a provision for heating, ventilation and air condition smoke control?
- Is there an emergency communications system?
- Does the building have area floor wardens? Have they been trained?
- Are firefighting equipment, emergency generators and lighting systems ready to use if needed?
- Are all exiting doors and exits clear?
- Are emergency hoses and fire extinguishers in working order (see Figures 17-2, 17-3, and 17-4)?
- Will security measures, such as locking of doors, interfere with evacuation of occupants or access of firefighters?
- Is the fire department familiar with the building in all aspects that would be helpful during an emergency?
- Has space been designated for a fire department command center in the building?



Figure 17-2. Make sure that all fire extinguishers are in working order and have been inspected monthly.



Figure 17-3. Sprinklers should exist in all modern office buildings.



Figure 17-4. Standpipes with an adequate water supply should also be inside the office building.

OFFICE FIRE PREVENTION STRATEGIES

The best time to think about fire safety is before a fire starts. Fire escape routes should be marked and fire alarm activation boxes should be strategically located for easy access (see Figure 17-5).



Figure 17-5. A pull-down to activate the fire alarm.

Fire drills should be conducted on a regular basis. All stairway exits should be accessible and marked as such since elevators may not function during a fire, or may expose passengers to heat, gas and smoke. All stairwells should be separated/sealed from the main occupancy areas and have their own ventilation system (see Figure 17-6).



Figure 17-6. Well-marked emergency exit.

Also, the following procedure should be followed:

- Heat-producing equipment—copiers, hot plates, and coffee makers—are often overlooked as potential fire hazards. Keep them away from anything that might burn.
- Electrical appliances can be fire hazards. Be sure to turn off all appliances at the end of the day. Use only grounded appliances plugged into grounded outlets (three-prong plug).
- If electrical equipment malfunctions or gives off a strange odor, disconnect it and call the appropriate maintenance personnel. Promptly disconnect and replace cracked, frayed, or broken electrical cords.
- Keep extension cords clear of doorways and other areas where they can be stepped on or chafed and never plug one extension cord into another. Never place rugs or other materials on extension cords since the cords will not be able to dissipate the heat from the flow of electrical current.
- Smoke only where permitted and have large non-tip ashtrays and empty them only when ashes, matches and smoking materials are cold. Make sure that no one, including visitors, has left cigarettes smoldering in wastebaskets or on furniture.
- Keep storage areas, stairway landings and other out-of-the-way locations free of waste paper, empty boxes, dirty rags and other material that could fuel a fire or hamper an escape.
- Arson is the largest single cause of fires in office buildings. Therefore proper security measure to keep unauthorized individuals out of the build-

ing will help prevent both theft and fire. In addition, make sure that alleys and other areas around buildings are well lit.

Through a program of scheduled inspections, unsafe conditions can be recognized and corrected before they lead to fires. You should take a few moments each day to walk through your work area. Look for items that have the potential to be fire hazards.

FIRE PREVENTION PLAN REQUIREMENTS

A fire prevention plan must be in writing, be kept in the workplace, and be made available to employees for review (see Figure 17-7). However, the employer with 10 or fewer employees may communicate the plan orally to employees {29 CFR 1910.39(b)}. At a minimum the fire prevention plan must include:

- A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard {29 CFR 1910.38(b)(2)(i)}.
- Procedures to control accumulations of flammable and combustible waste materials {29 CFR 1910.38(b)(3)}.
- Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials {29 CFR 1910.38(c)(5)}.
- The name and job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires {29 CFR 1910.38(b)(2)(ii)}.
- The name or job title of employees responsible for the control of fuel source hazards {29 CFR 1910.38(b)(2)(ii)}.
- An employer must inform employees upon initial assignment to a job of the fire hazards to which they are exposed. An employer must review with each employee the fire prevention necessary for self-protection. {29 CFR 1910.38(b)(4)(i-ii)}.

FIRE SAFETY/PREVENTION PLAN CHECKLIST

This checklist will often be completed by the fire department.

Building Name: _____ Address: _____

Contact: _____ Telephone No. _____

Checklist Date: _____

Completed by: _____

Accepted: _____ Not Accepted _____

- _____ Contents contained in a binder, usually red.
- _____ Table of contents.
- _____ Names and phone no. of fire safety director and assistant.
- _____ List of duties of fire safety director and assistant.
- _____ Copy of instructions to occupants (employees).
- _____ Procedure/frequency of fire drills.
- _____ List of those responsible for maintenance of firefighting and safety equipment.
- _____ A plan of the site.
- _____ A copy of the floor plans for each floor.
- _____ Instructions for fire response of occupants posted.
- _____ Have copies been distributed?

Comments: _____

Figure 17-7. Fire safety/prevention plan checklist.

FIRE SAFETY CHECKLIST

Periodically you should conduct a fire safety inspection or audit. In order to do this you can use, add to, or develop your own instrument similar to the one found in this section (see Figure 17-8).

FIRE SAFETY CHECKLIST

- | | | |
|------------------------------|-----------------------------|---|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Does the employer provide portable fire extinguishers for small fires? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are all fire extinguishers clearly marked with symbols that distinctly reflect the type of fire hazard for which they are intended? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are portable fire extinguishers located where they are readily accessible to employees without subjecting them to possible injury? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are fire extinguishers fully charged and operable at all times? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are all fire extinguishers clearly marked with symbols that distinctly reflect the type of fire hazard for which they are intended? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are fire detection systems installed and maintained to assure best detection of a fire? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is an employee alarm system installed that is capable of warning every employee of an emergency? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is the alarm system such that can be heard above the sound level of the work area? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are warning lights installed, if there are hearing impaired employees? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is all fire fighting equipment inspected at least annually, and records kept? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are portable fire extinguishers inspected at least monthly, and records kept? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is any damaged equipment removed immediately from service and replaced? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is hydrostatic testing done on each extinguisher at least every five years? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are fixed extinguishing systems inspected annually by a qualified person? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are fire detection systems tested monthly if they are battery operated? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is training done on the use of portable fire extinguishers, and records of attending employees kept? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is training provided to employees designated to inspect, maintain, operate, or repair fixed extinguishing systems? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Is an annual review training required to keep them up to date? |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Are all employees trained to recognize the alarm signals for each emergency (fire, tornado, chemical release, etc.)? |

<input type="checkbox"/> Yes <input type="checkbox"/> No	Are employees trained in how to report an emergency, where the alarms are, and how to sound them?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Is training provided on evacuation procedures?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are drills performed periodically to ensure employees are aware of their duties?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Is all training conducted by a qualified/competent person?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are combustible scrap, debris, and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite promptly?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Is proper storage practiced to minimize the risk of fire including spontaneous combustion?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are approved containers and tanks used for the storage and handling of flammable and combustible liquids?

Figure 17-8. Fire safety checklist.

SUMMARY

If you discover a fire or see/smell smoke, immediately follow these procedures:

1. Notify the local fire department.
2. Notify physical security or building security force.
3. Activate the building alarm (fire pull station). If not available or operational, verbally notify people in the building.
4. Isolate the area by closing windows and doors and evacuate the building, if you can do so safely.
5. Shut down equipment in the immediate area, if possible.
6. If possible and if you have received appropriate training, use a portable fire extinguisher to:
 - assist oneself to evacuate.
 - assist another to evacuate.
 - control a small fire.
7. Do not collect personal or official items; leave the area of the fire immediately and walk, do not run, to the exit and designated gathering area.
8. Provide the fire/police teams with the details of the problem upon their arrival. Special hazard information you might know is essential for the safety of the emergency responders. You should not re-enter the building until directed to do so. Follow any special procedures established for your unit.
9. If the fire alarms are ringing in your building, you must evacuate the building and stay out until notified to return. Move to your designated

meeting location or upwind from the building staying clear of streets, driveways, sidewalks, and other access ways to the building. If you are a supervisor, try to account for your employees, keep them together and report any missing persons to the emergency personnel at the scene.

One result of the recent trend toward open office environments is that smoke from office fires is not contained or isolated as effectively as in less open designs. Open office designs allow smoke to spread quickly and the incorporation of many synthetic and other combustible material in office fixtures (such as furniture, rugs, drapes, plastic wastebaskets, and vinyl covered walls) often make “smoky” fires. In addition to being smoky, many synthetic materials can emit toxic materials during a fire. For example, cyanide can be emitted from urethane that is commonly used in upholstery stuffing. Most burning materials can emit carbon monoxide. Inhalation of these toxic materials can severely hamper an office worker’s chances of getting out of a fire in time. This makes it imperative for office workers to recognize the signal to evacuate their work area and know how to exit in an expedient manner.

If an individual is overexposed to smoke or chemical vapors, remove the person to an uncontaminated area and treat for shock. Do not enter the area if you suspect that a life threatening condition still exists (such as heavy smoke or toxic gases). If CPR certified, follow standard CPR protocols. Get medical attention promptly.

If your or another person’s clothing catches fire, extinguish the burning clothing by using the drop-and-roll technique, wrap victim in a fire blanket or douse victim with cold water (use an emergency shower if it is immediately available). Carefully remove contaminated clothing; however, avoid further damage to the burned area. Cover injured person to prevent shock. Get medical attention promptly.

Poor housekeeping contributes to an increased frequency of loss and greater loss potential. The added distribution of fuel:

- Increases the probability of fire and explosion.
- Causes a greater continuity of combustibles, making it easier for fire to spread.
- Increases combustible loading by providing more fuel to feed a fire.
- Creates the potential for dust explosions when dust accumulates.
- Increases the probability of spontaneous ignition.

As part of the preparation for a fire, the following should have been accomplished:

- Learn the sound of the building’s fire alarm. Encourage management to schedule regular fire drills so that everyone will know how the alarm sounds and how to escape.
- Evacuation plans for the building should be posted where everyone can see them. They should be discussed with new employees during orientation.
- Learn the evacuation plan and participate in fire drills.
- Know the location of the two exits closest to their work area. Count the number of doors between their office and each of those exists—in case they must escape through a darkened, smoke-filled corridor where they can’t see very well.
- Each person with a disability should be assigned a co-worker (and an alternate) to render assistance in case of an emergency. Participating in

drills is especially important for those with disabilities.

- Be sure that stairwell doors are never locked.

In case of fire, workers should be told to do the following:

- Sound the alarm and call the fire department. Large fires start as small fires.
- Close the door to the room containing the fire and close all other doors that are passed through during their escape, assuming that they are the last people out. Closing the doors helps control the spread of fire.
- If it becomes necessary to use an escape route where there is smoke, crawl low under the smoke. Stay close to the floor where visibility is better, the air is less toxic and it is cooler.
- Before opening a closed door, workers should feel it with the back of their hands. If it is hot, don't open it. Use an alternate escape route. If it feels normal, open it carefully.
- Be ready to slam a door shut if heat or smoke starts to rush in. Once workers are outside the building, they should move well away from the building to a designated meeting area where all workers can be accounted for. If anyone is missing, notify the fire department. DO NOT re-enter the building.
- If it's not possible for workers to escape from the floor they are on, they shouldn't panic but stay calm and try to go to a room with an outside window and stay there. Try to keep smoke out and be sure doors are closed. Stuff the cracks around the door and vents using clothing, towels, paper or whatever is available. If water is available, dampen a cloth and breathe through it to filter out smoke and gases. If there is a working telephone or cell phone, call the fire department and tell them exactly where you are. This information will be relayed immediately to the firefighters on the scene. Stay where you are and wave something to attract their attention.
- Never use an elevator during a fire emergency. Most modern elevators select buttons are heat-activated, so they might go to the fire floor and stop with doors wide open, exposing passengers to deadly heat and fumes.

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- City of Phoenix, *High-Rise Fire Safety*. <http://www.ci.phoenix.az.us/FIRE/highrise>: Phoenix, 2003.
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CHAPTER 18

OFFICE FIRST AID



Example of a wall-mounted first aid kit

It is the employer's responsibility according to OSHA to provide for medical services and first aid. OSHA has developed and promulgated a regulation that addresses medical services and first aid. It is found in 29 Code of Federal Regulations (CFR) 1910.151. According to this regulation, the employer shall ensure the ready availability of medical personnel for advice and consultation on matters of health.

In the absence of a nearby infirmary, clinic, or hospital that is used for the treatment of all injured employees, a person or persons should be adequately trained to render first aid. Adequate first aid supplies should be readily available.

Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body should be provided within the work area for immediate emergency use.

First aid supplies are required to be readily available. An example of the minimal contents of a generic first aid kit is described in American National Standard (ANSI) Z308.1-1978 Minimum Requirements for Industrial Unit-Type First-Aid Kits. The contents of the kit listed in the ANSI standard should be adequate for small worksites. When larger operations or multiple operations are conducted at the same location, employers should determine the need for additional first aid kits at the worksite, additional types of first aid equipment and supplies and additional quantities and types of supplies and equipment in the first aid kits.

In a similar fashion, employers who have unique or changing first aid needs in their workplace may need to enhance their first aid kits. Consultation from the local fire/rescue department, appropriate medical professional, or local emergency room may be helpful to employers in these circumstances. By assessing the specific needs of their workplace, employers can ensure that reasonably anticipated supplies are available. Employers should assess the specific needs of their worksite periodically and augment the first aid kit appropriately.

If it is reasonably anticipated that employees will be exposed to blood or other potentially infectious materials while using first aid supplies, employers are required to provide appropriate personal protective equipment (PPE) in compliance with the provisions of the Occupational Exposure to Blood-Borne Pathogens standard, 29 CFR 1910.1030. This standard lists appropriate PPE for this type of exposure, such as gloves, gowns, face shields, masks, and eye protection.

FIRST AID KITS

First aid kits should be available to those administering first aid so they can be accessed within 3–4 minutes. Thus, it seems appropriate to expect that a first aid kit should be on each floor of an office building and in each employer's office area or suite. A first aid kit needs assessment should be made that takes into account the areas of an office building floor, accessibility to the office areas, number of workers, number of employers, and number of trained first aid personnel.

As was stated earlier, the first aid kit should meet the minimum requirement of the American National Standards Institutes (ANSI) Z308.1 standard for Minimum Requirements for Workplace First Aid Kits. The first aid kit should be prominently displayed and a system in place for inspecting them and re-supplying them as necessary. First aid kits have a way of becoming depleted of supplies (see Figure 18-1).

An example of the contents of a first aid kit that meets the ANSI Z308.1 criteria is as follows:

- 1" x 3" Adhesive plastic bandages (16/box)*.
- 32 sq. in. Absorbent gauze compress (1/box)*.
- Triangular sling/bandage (1/box)*.
- 3" x 3" Gauze dressing pads (4/box)*.
- Antiseptic cleansing wipes (10/box)*.
- 1/2 x 2.5 yds. Adhesive tape (2/box)*.
- Exam quality gloves (2pr/box)*.
- Burn relief packs (6/box)*.

*** Minimum ANSI Z308.1 content requirements for a first aid kit.**



Figure 18-1. A stocked first aid kit.

Recommended contents for a first aid kit and other contents can be added based upon specific existing hazards:

- 1" x 3" Fabric bandages (16/box).
- Fingertip fabric bandages (8/box).
- Knuckle fabric bandages (8/box).
- 3" Compress bandage off center (2/box).
- Iodine infection control wipes (10/box).
- Antiseptic soap pads.
- Rescue breather CPR one-way valve face shield (1/box).
- Instant cold compress (1/box).
- Sterile eye pads, 1 oz.
- Eye wash, 1/2 x 5 yds.
- First aid tape roll (1/box).
- First-aid ointment or antiseptic cream.
- Gauze roll.
- Microbial hand wipes.
- Pain relief (e.g. aspirin, ibuprofen, tylenol).
- Scissors.
- Tweezers.
- AMA first aid guidebook.

Where the hazards of corrosives or similar chemicals are present, it is good first aid practice to have a drenching shower and eye flushing facility available.

TRAINING

It is important that adequate numbers of individuals be trained in at least first aid. Seldom does any workplace not have medical emergencies and having individuals trained in multiple floor office buildings is even more important since response between floors may not be timely. Although OSHA does not recommend any providers of first aid training, the American Red Cross and the National Safety Council are recognized providers of quality first aid training.

Basic first aid training is usually 5 to 5 1/2 hours in length and covers the following:

- How to determine the safe response to an emergency situation.
- Recognizing and caring for life-threatening emergencies in adults, such as respiratory, choking and cardiac problems.
- Caring for injuries including severe cuts and burns, sprains and strains.
- Caring for sudden illnesses such as poisonings, bites and stings.
- Recognizing and caring for heat- and cold-related emergencies.
- Workplace emergency planning.

It is recommended that another 4 1/2 hours be spent to include training individuals in the hands-on skills training for adult cardio pulmonary resuscitation (CPR) and automated external defibrillation (AED) which prepares participants to respond to breathing and cardiac emergencies. A life saved is worth the investment since a death in the workplace is very disruptive and results in lost productivity during the mourning and transition period.

PERFORMING FIRST AID

OSHA does not require employers to assign adequately trained employees to first aid duties, but in the absence of professional medical care in close proximity, it would be a wise business decision to do so for humanitarian and liability purposes. Medical emergencies happen where people are working and should be planned for to assure a timely and effective response to them. It is a good idea to maintain a list of all first aid events for your records in case such injuries escalate into more serious events. An example of a first aid log can be found in Figure 18-2.

Another issue arises when a worker is assigned to first aid duties, which you should be aware of. Workers who have potential occupational exposure to blood or other potentially infectious materials (OPIM) are covered by the Blood-borne Pathogen Standard (29 CFR 1901.1030). Occupational exposure is defined as reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or OPIM that may result from performance of an employee's duties. The vaccination requirements, as well as all other provisions of the standard, apply to all employees who have occupational exposure to potentially infectious materials.

First Aid Log
For an
(Office Building)

Injured Worker's Name

Job of Injured Worker

Immediate Supervisor

DateTime of Injury

Cause of Injury

Body Part Injured

Nature of Injury

Treatment Rendered

Returned to WorkSent HomeSent to Hospital

Injured Worker's Name

Job of Injured Worker

Immediate Supervisor

DateTime of Injury

Cause of Injury

Body Part Injured

Nature of Injury

Treatment Rendered

Returned to WorkSent HomeSent to Hospital

Injured Worker's Name

Job of Injured Worker

Immediate Supervisor

DateTime of Injury

Cause of Injury

Body Part Injured

Nature of Injury

Treatment Rendered

Returned to WorkSent HomeSent to Hospital

Injured Worker's Name

Job of Injured Worker

Immediate Supervisor

DateTime of Injury

Cause of Injury

Body Part Injured

Nature of Injury

Treatment Rendered

Returned to WorkSent HomeSent to Hospital

Figure 18-2. First aid log form.

Employees who are designated to provide first aid as a primary or collateral duty are covered by the Blood-Borne Pathogen Standard; however, employees who perform an unanticipated “good Samaritan act” are excluded from coverage by the standard since such an action does not constitute “occupational exposure.”

BIOLOGICAL WASTE

In many office buildings you will have individuals who must use injections as part of medically prescribed self-treatment (e.g., diabetics). You should have containers for proper disposal of used syringes or other biological waste that present a hazard to other workers. Syringes should be placed in plastic containers marked with the international symbol for biological hazards to prevent inadvertent needle sticks to other workers.

Any potential infectious material, contaminated with blood or body fluids, should be disposed of in red plastic bags that have the international symbol for biological hazards (see Figure 18-3) on them. This could be soiled materials or soaked materials from a spill. You should follow the universal precaution when handling such materials.



Figure 18-3. International symbol for biohazards.

Universal precautions are infection-control guidelines designed to protect workers from exposure to disease spread by blood and certain types of body fluids. In the workplace, universal precaution should be followed when workers are exposed to blood or certain other body fluids, including:

- Semen.
- Vaginal secretions.
- Synovial fluid.
- Cerebrospinal fluid.
- Pleural fluid.
- Peritoneal fluid.

- Pericardial fluid.
- Amniotic fluid.

Universal precautions do not apply to:

- Feces.
- Nasal secretions.
- Sputum.
- Sweat.
- Tears.
- Urine.
- Vomitus.
- Saliva (except dental settings).

Barriers can be used to protect against occupational exposure to blood and certain body fluids. These barriers consist of:

- Personal protective equipment (PPE).
- Engineering controls.
- Work practice controls.

Personal protective equipment includes gloves, lab coats, gowns, shoe covers, goggles, glasses with side shields, mask, and resuscitation bags. The purpose of personal protective equipment is to prevent blood and body fluids from reaching the workers' skin, mucous membranes, or personal clothing. It must be an effective barrier between the exposed worker and any blood or other body fluids.

Engineering controls refer to methods of isolating or removing hazards from the workplace. Examples of engineering controls include: sharps disposal containers, laser scalpels and ventilation including the use of ventilated biological cabinets (laboratory fume hoods).

Work practice controls refer to practical techniques that reduce the likelihood of exposure by changing the way a task is performed. Examples of these activities requiring specific attention to work practice controls include: hand washing, handling of used needles and other sharps and contaminated reusable sharps, collecting and transporting fluids and tissues according to approved safety practices.

The universal precautions are a requirement as part of the Bloodborne Pathogen Standard.

SUMMARY

The provision of medical care and first aid should not be viewed lightly by owners and employers. It may be well worth your dollars to set up an infirmary in very large office complexes. But, at the least, you should have adequate first aid supplies and trained individuals who can respond in an effective manner to medical emergencies.

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CHAPTER 19

OFFICE BUILDING MAINTENANCE



All office buildings require some degree of continued maintenance in order to keep them structurally sound, operating efficiently, and safe and healthy for those that occupy them.

Office building maintenance personnel are required to be the jack-of-all-trades so to speak. Whatever needs repair they are called upon to fix it. These workers should be recognized by their standard uniform not by their lack of professionalism. They are always highly visible in the office building and seen by employees, workers, clients and visitors. They must be able to venture into all parts of the office building without raising concerns of any occupants of office complexes, suites, or individual offices, in rest rooms, in utility areas, boiler rooms, etc.

HAZARDS

Thus, these workers are faced with a myriad of hazards that could potentially injure or make them sick. The outside ground crews in all likelihood may be part of the maintenance department. Some of the hazards that the inside maintenance staff face include:

- Confined spaces.
- Pressure vessels.
- Electricity.
- Burns from steam and hot water.
- Falls.
- Slips and trips.
- Hand and power tools.
- Blood-borne pathogens.
- Chemicals.

JOB RESPONSIBILITIES

The maintenance staff has such a variety of worker tasks that it is almost impossible to describe each and every possible job that they perform. Some of their responsibilities include the following:

- Fix plumbing.
- Move furniture.
- Unload materials.
- Fix electrical problems (see Figure 19-1).
- Repair heating and air conditioning equipment.
- Repair damaged ceiling, floors, and walls.
- Repair fixtures (door handles).
- Repair handrails.
- Do carpentry activities (e.g., repair doors).
- Repair or replace broken windows.
- Repair locks.
- Clean up chemical spills if trained to do so.
- Ensure chemicals and materials are stored properly.
- Install new equipment or furnishings.
- Service heating, ventilation, and air conditioning (HVAC) system.

PREVENTIVE MAINTENANCE

Preventive maintenance for your office building should be implemented and followed. In the long run this will reduce costs and keep deterioration of the infrastructure to a minimum. By planning for preventive maintenance you will decrease the chance of catastrophic failures, potential fires, and emergencies. Preventive maintenance is a way of insuring your investment in the office building. This type of



Figure 19-1. Office-building maintenance worker making repairs on a light.

maintenance falls to your inside maintenance crew and must be performed according to a schedule that you have set.

DEVELOP A WORK ORDER SYSTEM

Maintenance does not just refer to repairs of but to the servicing of existing systems. But the failure to respond to requests for repairs may cause greater harm in the long run. You need to be sure that your maintenance personnel respond to requests for repairs. These completions of repairs go a long way toward decreasing or mitigating potential hazards. You should develop a work order system. An example of a work order for an office building is found in Figure 19-2.

EMPLOYER RESPONSIBILITIES

It is the employer's responsibility to supply tools to workers that are safe and undamaged. Also, the employer is responsible for training workers on the safe use of tools. If an employee is required to wear personal protective equipment (PPE) to perform the job, it is the employer's responsibility to supply the appropriate PPE without cost and to train the worker in the use of the PPE. An example of a PPE needs assessment can be found in Appendix G.

WORK ORDER
FOR
OFFICE BUILDING

Requestor Name:_____Date:_____

Requestor Telephone: _____E-mail:_____

Location of Hazard or Maintenance Issue:

Floor Number:_____

Office Number: _____

Restroom Location: _____

Storage Area: _____

Stairway Location:_____

Emergency Equipment Location:_____

Other Location (Specify):_____

Nature of the Problem (Describe in Detail): _____

Name and Date Maintenance Supervisor Received Notification: _____

Name and Date of Staff Assigned to Address the Issue: _____

Maintenance Staff Describe What Was Found and Estimate Time to Address Issue:_____

Signature of Staff Completing the Work Order and Date Completed:

Signature_____Date_____

Date Supervisor Notified Requestor of Completion of the Work Order: _____

Figure 19-2. Work order form.

SAFE MAINTENANCE PROCEDURES

Failure to follow safe maintenance procedures can result in the endangerment of other occupants in an office building as well as the maintenance personnel themselves. Maintenance personnel should be trained to perform their work without endangering office-building occupants. In order to work in a safe and healthy manner, inside maintenance staff should:

- Provide barriers around danger areas.
- Not block escape ways or emergency exits.
- Not leaving tripping hazards (e.g., tools or materials) lying around.
- Not leave energized conductors exposed.
- Not leave operating equipment unattended.
- Use lockout/tagout procedures.
- Clean up all chemical spills immediately.
- Protect other occupants from overhead hazards.
- Replace all guards that have been removed.
- Remove all recognized hazards.
- Not leave dangerous areas unsecured or unattended.
- Not leave tools unattended.
- Secure all ladders when not in use.
- Make others aware of any hazards.

Maintenance activities and workers themselves can create hazards for office workers, clients, and visitors in an office building as well as themselves. In the maintenance areas itself all aisles, emergency exits, fire extinguishers, etc. are to be kept clear (a minimum of three feet on either side) at all times. Storage areas are to be maintained orderly at all times in the following manner:

- Pipe stock stored horizontally on racks and sorted by size.
- Metal stock stored horizontally on racks and sorted by size.
- Sheet-metal stock stored vertically in racks and sorted by size.
- All fittings, etc. stored in bins on shelves and sorted by type and use.
- All flammables stored in approved cabinets and self-closing approved container as necessary.

Spills are to be cleaned up immediately by the person responsible and wastes disposed of properly. All refuse and waste materials are to be placed in the appropriate waste containers for disposal.

Maintenance, inside and outside, as well as custodial services may be contracted out by the building owners or employers. This leads to a loss of control over this facet of providing a safe and healthy office building. Although this is a convenient arrangement, it may not be the best arrangement if you are at all concerned with the overall safety and health within your office building. Contracting out has been discussed in some detail in Chapter 11.

MAINTENANCE CHECKLIST

A comprehensive checklist is provided for building maintenance to be altered and used as is appropriate for your situation (see Figure 19-3).

BUILDING MAINTENANCE CHECKLIST

Walking Surfaces

- ☐ Yes ☐ No Are all walking surfaces free of cracks or holes?
- ☐ Yes ☐ No Are all carpets free from tears or damage that could cause tripping?
- ☐ Yes ☐ No Are all stairway surfaces free from damage that could result in a fall?
- ☐ Yes ☐ No Are there any unusually or unexpected elevations or dips in walking areas?
- ☐ Yes ☐ No Are all handrails in good repair?
- ☐ Yes ☐ No Are non-skid surfaces repaired as needed?

Walls and Ceilings

- ☐ Yes ☐ No Are all holes or damaged walls repaired?
- ☐ Yes ☐ No Are there hazardous protrusions coming out of walls?
- ☐ Yes ☐ No Is there exposed wire either from the walls or ceilings?
- ☐ Yes ☐ No Are all stained or damaged ceiling tiles replaced?

Lighting

- ☐ Yes ☐ No Are all lights in working order?
- ☐ Yes ☐ No Have all burned-out bulbs been replaced?
- ☐ Yes ☐ No Are all windows clean?
- ☐ Yes ☐ No Are light diffusers clean and in good repair?
- ☐ Yes ☐ No Are emergency lights tested monthly and repaired as necessary?

Doors

- ☐ Yes ☐ No Are door handles, hinges, and catches in good repair?
- ☐ Yes ☐ No Do large glass doors have accident prevention warning stickers on them?
- ☐ Yes ☐ No Do glass doors have a push/pull plate for safe operations?
- ☐ Yes ☐ No Are outside doors fitted with weather seals where necessary?
- ☐ Yes ☐ No Are glass doors with cracks or holes replaced?
- ☐ Yes ☐ No Is the glass used in doors of the safety type?
- ☐ Yes ☐ No Are doors wheelchair accessible?

Restrooms

- ☐ Yes ☐ No Are all drains free and flowing?
- ☐ Yes ☐ No Are there leaks in plumbing?
- ☐ Yes ☐ No Are all commodes and urinals functioning properly?
- ☐ Yes ☐ No Are all stall walls, doors and latches in repair?

- ☐ Yes ☐ No Are all paper dispensers secured to the walls and in good repair?
- ☐ Yes ☐ No Are any floor tiles or wall tiles that are broken replaced?
- ☐ Yes ☐ No Do all water faucets and valves function properly?
- ☐ Yes ☐ No Are cracked sinks, commodes, and urinals replaced?
- ☐ Yes ☐ No Is ventilation adequate in the restrooms?

Indoor Air Quality

- ☐ Yes ☐ No Is preventive maintenance conducted on the HVAC system?
- ☐ Yes ☐ No Are ducts and vents cleaned?
- ☐ Yes ☐ No Are all filters replaced?
- ☐ Yes ☐ No Are temperature and humidity monitored in all work areas regularly?
- ☐ Yes ☐ No Are complaints investigated related to IAQ?

Furniture

- ☐ Yes ☐ No Is all damaged furniture repaired or removed from the building?
- ☐ Yes ☐ No Is furniture used for what it was intended for?

Ladders

- ☐ Yes ☐ No Are all ladders in good repair or removed from the building?
- ☐ Yes ☐ No Are ladders designed to support their intended load?
- ☐ Yes ☐ No Are those using ladders trained in safe ladder usage?

Electrical

- ☐ Yes ☐ No Are no bare wires exposed to occupants?
- ☐ Yes ☐ No Are all electrical panels secured against unauthorized access?
- ☐ Yes ☐ No Are all electrical switches, receptacles, plugs, or sockets in a repaired state?
- ☐ Yes ☐ No Are all circuits that are not repaired deenergized and tagged?

Heat

- ☐ Yes ☐ No Is preventive maintenance conducted on boilers?
- ☐ Yes ☐ No Are auxiliary heaters inspected for faulty operation?
- ☐ Yes ☐ No Are thermostats inspected for proper operation?

Tools and Equipment

- ☐ Yes ☐ No Are any faulty tools repaired or removed from service?
- ☐ Yes ☐ No Are any outdated tools or equipment replaced or removed from service?

Firefighting Equipment

- ☐ Yes ☐ No Is all firefighting equipment inspected on a monthly basis to ensure proper operation when needed?
- ☐ Yes ☐ No Are fire alarms tested to ensure proper operation?
- ☐ Yes ☐ No Are all fire exit signs working and lit?
- ☐ Yes ☐ No Are all fire extinguishers properly stored or mounted on walls?

☐ Yes ☐ No Are evacuation maps posted on walls for emergencies?

Plumbing

☐ Yes ☐ No Are deteriorating pipes and valves replaced prior to failure?

☐ Yes ☐ No Are all leaks tended to in a timely fashion?

☐ Yes ☐ No Are all drains inspected to ensure that they are open?

Signage

☐ Yes ☐ No Are all emergency or direction signs posted?

Noise

☐ Yes ☐ No Are areas of high noise evaluated?

☐ Yes ☐ No Are efforts made to dampen or deaden disturbing noises?

Maintenance Shop

☐ Yes ☐ No Is the shop tidy with bench tops and floor clear of materials?

☐ Yes ☐ No Does the layout of furniture and equipment allow for free safe movement of maintenance crews?

☐ Yes ☐ No Is all equipment guarded?

☐ Yes ☐ No Are floors non-skid?

☐ Yes ☐ No Are danger zones around powered machines clearly delineated e.g. by yellow lines?

Personal Protective Equipment (PPE)

☐ Yes ☐ No Has a PPE needs assessment been done?

☐ Yes ☐ No Is PPE required?

☐ Yes ☐ No Do maintenance personnel wear their PPE/

☐ Yes ☐ No Is the wearing of PPE enforced?

Figure 19-3. Building maintenance checklist.

SUMMARY

Proper office building maintenance ensures the building a level of income. The office building owner's intent is to have the highest rents obtainable, have the least amount of vacancies possible, and to keep operating expenses to a minimum. Many of today's less attractive office buildings were once rated at high levels, but poor maintenance and management practices have decreased their earning potential. Neglect tends to cause the degradation of office buildings over the long run.

There are benefits to keeping office buildings in a high state of repair. Maintenance pays for itself in the following ways:

- Tenant retention—Future and existing tenants have a low tolerance for faulty HVAC systems, leaking roofs, drafty windows, and the absences

of modern amenities. Deferred maintenance is a common factor that forces tenants into the marketplace to seek alternatives to their current location. On the whole, landlords who employ sound management practices and routine maintenance reap the benefits of keeping their existing tenants.

- Decreased absorption time, lower vacancy rate—Absorption is the time necessary for a vacant space to become occupied. No matter how well maintained and managed a building is, every owner will eventually face some level of vacancy. A properly maintained building is typically vacant for a shorter period of time in comparison to its poorly maintained counterpart.
- Decreasing owner Liability and Increased Tenant Safety—Routine maintenance and the appropriate management practices decrease owner liability while increasing tenant safety. Regularly scheduled maintenance will ensure a building is operating properly during an emergency situation.

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CHAPTER 20

OUTSIDE/GROUNDS MAINTENANCE



Well-maintained grounds around an office building.

The outside ground maintenance crews can be an asset in ways other than caring for the grounds, walkways, and outside structural (e.g., changing lights) issues. Professional ground crews contribute to the overall appearance of the quality of your office building. It is good for business to have uniformed ground crews. The uniformed ground crews can be a visible and physical asset if they have been trained to recognize potential problems that might impact security and pose a risk to the office building or the workforce (see Figure 20-1). They should be taught the proper policies and procedures to follow in making responses to risky situations.

Although security is not the primary duty of the outside maintenance operation, the duties are really varied and many and thus are broad-ranging such as those that follow:



Figure 20-1. Ground crew members add another pair of eyes in protecting an office building.

- Sweeping walkways, driveways, or parking areas.
- Painting outdoor structures and warning lines.
- Emptying outside trash and recycling containers.
- Cleaning up debris and litter (see Figure 20-2).
- Handling chemicals used in their tasks.
- Performing lawn care.
- Working on ladders.
- Mowing, trimming, and landscaping outside areas (see Figure 20-3).
- Removal of ice and snow by plowing and shoveling.
- Repair or replacing damaged signs, fences, etc.
- Application of fertilizers, pesticides, and herbicides.



Figure 20-2. A well-maintained outside trash and debris disposal area.



Figure 20-3. Grounds crew trimming trees.

Each outside activity carries with it some degree of risk of being injured or becoming ill from the physical hazards (e.g., mowers) or chemical hazards (e.g., pesticides or solvents) to which outside maintenance crews are exposed.

These workers need to be trained in both physical and chemical hazards when they have the potential for exposure. A set of safety and health rules needs to be developed just for the outside grounds personnel that specify the safety and health expectation for them. In order to hold the grounds crews responsible for safe and healthy work performance. They will need to be trained in most of the following areas:

- Use of hand tools.
- Use of power tools.
- Use of lawn and shrub care tools.
- Use of chemical and hazard communications.
- Safe lifting and material handling.
- Use of ladders.
- Emergency response.
- Fall protection.
- Security.
- Excavation and confined spaces safety.
- Personal protective equipment.
- Fire prevention and use of firefighting equipment.

All training given to employees should be documented in writing (see Employee Training Form in Chapter 3). You might ask why train outside personnel or make the investment. These employees are exposed to more risk than an office worker. No worker should be expected to perform a task that he or she is not adequately trained to accomplish.

APPLICATION OF PESTICIDES

The application of pesticides should not be done by anyone other than someone commercially licensed in pesticides application. Because pesticides are persistent, they retain the potential to poison workers even after they have been applied.

OTHER CHEMICALS

All workers should be trained in hazard communications. An explanation of the Hazard Communication Standard (29 CFR 1910.1200) is found in Chapter 14. Workers must have knowledge of the hazards of any chemical that they use including cleaning agents, lubricants, fuels (flammable and combustible fluids), etc. For the flammable liquids, handling and storage are as follows:

- All flammables must be stored in approved flammable storage cabinets or stored outside (at least 50 feet from an structure).
- Fuels, solvents, and other flammables (not stored in original containers) are to be stored in approved self-closing containers with flame arresters. Flammables may not be stored in open containers (open parts dip tanks, etc.).
- Flammable storage areas are to be kept dry and well ventilated. No storage of combustible materials, open flames or exposed electrical components are permitted in the flammable storage area.
- Flammable or combustible materials may not be stored in electrical rooms.
- Electrical rooms must be kept clean and dry at all times.

The storage of chemicals for outside use should be kept outside of the office environment in outside buildings or specific inside storage areas.

Careful attention should be paid to chemicals that are under pressure such as paints, lubricants, solvents, and some adhesives. The aerosols and vapors from their use could enter the lungs or eyes and cause irreversible damage to the worker. During the use of chemicals under pressure, the use of respirators may be considered if there is not a continuous flow of air that results in a well-ventilated work area.

PHYSICAL HAZARDS

Many types of physical hazards exist from all the types of tools and powered equipment that outside ground crews have to maintain and operate. These include:

- Mowing equipment.
- Weed trimmers.
- Shrub and hedge trimmers.
- Snow blowers.
- Leaf blowers.
- Power saws.
- Drills.

Workers should be trained in the proper operation of these types of equipment. Workers should use leather gloves, have eye protection with side shields, hard-toed safety shoes, and hearing protection (e.g., ear muffs). Each task performed by outside grounds personnel may require other types of personal protective equipment (PPE). Employers need to conduct a PPE hazard assessment to determine the appropriate PPE needs of the workforce (See Appendix G).

EXCAVATIONS

Although in most cases you would not expect grounds crews to be exposed to the hazards of trenches or excavation. Any excavation greater than between four and five feet should be considered dangerous and workers should not enter without training and protection from cave-in (see Figure 20-4).



Figure 20-4. Excavation during construction activities can be a hazard to grounds crews.

CONFINED SPACES

No worker should enter any utility vault, sewer line, or similar structure with limited access or ventilation or not meant for worker occupancy without training and use of the proper entry procedures.

POISONOUS PLANTS

Not all workers are susceptible to poisonous plants such as poison ivy, oak, and sumac. They should be taught to identify and steer clear of contact with poisonous plants. About 85% of the population will have a reaction when contacting these plants. Workers should never burn these plants since the irritating chemical could make contact with the skin or be breathed into the lungs with adverse affects. An effort should be made to safely eradicate these poisonous plants.

POLICIES AND PROCEDURES FOR GROUNDS MAINTENANCE

Policy

Landscape and grounds maintenance involves the use of various sizes and types of lawnmowers, grass/weed cutting tools, edgers, hedge clippers, and other hand tools. The most significant dangers are being struck by the blade or a foreign object thrown by the high speed blades and noise-induced hearing loss.

Procedures

Personal Protective Equipment and Safeguards

Workers shall wear face shields or goggles or glasses with side shields, safety toed boots, and hearing protection during operation of all lawn mowers. Gloves may be worn when using walk-behind mowers. Bump caps should be worn when using a riding or towed mower around tall brush and low hanging limbs of trees. All mower discharge chutes shall be guarded with shields or approved grass catchers to deflect or stop foreign objects during operation.

Operating Practices Applicable to Push, Self-Propelled, and Riding Mowers

Operators shall be trained and qualified to operate the different types of mowers available. Manufacturers' instructions and operating procedures shall be followed.

Prior to mowing, operators shall clear the area to be mowed of all people and inspect for objects, raised sprinkler heads, holes, soft ground, and obstructions.

Mower shall not be left unattended. For riding mowers, the engine shall be shut off and all drives disengaged prior to getting off the mower. No riders are permitted on riding lawn mowers. The engine on push and self-propelled mowers shall be turned off while moving to another job location or while passing over curbs, loose gravel, or other similar obstructions. Power to attachments shall be disengaged on riding or towed mowers while passing over similar obstructions and when traveling over unobstructed areas and roads on the way to the next job site or return to the shop.

Mower blades' cutting height should normally be set as near to 2 inches as possible. Blades shall never be set lower than 1-1/2 inches.

When mowing hills and slopes, operators shall know the special precautions to follow. Slopes, hills, and banks exceeding a 30° angle shall be mowed with a push or self-propelled walk-behind mower in a horizontal (across) direction.

Electric hedge clippers shall be inspected, cleaned, oiled, and sharpened as required when in use. A grounded power cord shall be used if the tool is not double insulated. The cord shall be inspected before use and daily for condition. The cord shall be kept away from the cutting surface and out from under the feet of the operator. The cutting teeth of the clipper shall be pointed toward the body of the operator. The unit shall be shut off and unplugged while moving from job to job. Gloves (leather or cut-resistant) shall be worn when operating hedge clippers. No electrical power tools shall be operated in rain, sprinklers, or any kind of precipitation.

A checklist for outside grounds activities is found in Figure 20-5.

OFFICE BUILDING'S GROUND MAINTENANCE CHECKLIST

Lawn Care

- ☐ Yes ☐ No Is grass cut regularly?
- ☐ Yes ☐ No Are small trees, bushes, and shrubs trimmed as needed?
- ☐ Yes ☐ No Is the area surveyed to make sure bottles, trash, and other debris up?
- ☐ Yes ☐ No Are lawn and garden plants replaced and maintained?
- ☐ Yes ☐ No Are all plants fertilized according to the season and as needed?
- ☐ Yes ☐ No Is all lawn equipment maintained in working order?
- ☐ Yes ☐ No Are all supplies stocked to ensure the upkeep of the lawn?
- ☐ Yes ☐ No Are dead plants, trees and shrubs removed, including dead limbs?
- ☐ Yes ☐ No Are any poisonous-to-the-touch plants removed?

Grounds

- ☐ Yes ☐ No Is the area surrounding the building such as front entrances, disposal areas, parking areas, and alleys free from debris?
- ☐ Yes ☐ No Are all outside drains clean and debris free?
- ☐ Yes ☐ No Are outside windows cleaned regularly?
- ☐ Yes ☐ No Is there an adequate supply of cleaning materials such as brooms, dust-pans, cleaners, etc?
- ☐ Yes ☐ No Are recycling areas maintained?
- ☐ Yes ☐ No Are fences and gates maintained in good repair and any repairs made as necessary?

Exterior Walls

- ☐ Yes ☐ No Are all surfaces free from holes, damage, or loose material that would let in rain, moisture, insects or animals?
- ☐ Yes ☐ No Do less than 20% of exterior wall surfaces, gutters, and windows have chipping or peeling paint?

Exterior Openings

- ☐ Yes ☐ No Are exterior openings fitted with an appropriate window, door, hatchway, or crawl-space cover?
- ☐ Yes ☐ No Do windows and doors fit tightly within the frame and in good working condition?
- ☐ Yes ☐ No Are glass window panes free of open cracks or holes?
- ☐ Yes ☐ No Are awnings in good repair?

Hard Surfaces, Walkways, and Driveways

- ☐ Yes ☐ No Are all hard surfaces, such as concrete and asphalt, in good repair and free from tripping hazards?

<p><u>Guttering</u></p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No Are gutters and downspouts in good repair and free of leaf debris?</p> <p><u>Attached Structures</u></p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No Are porches, fire escapes, decks, and railings maintained in good condition?</p> <p><u>Exterior Storage</u></p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No Are items stored within a fully enclosed structure or screened from view of the public?</p>
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Figure 20-5. Office building ground maintenance checklist.

SUMMARY

The grounds surrounding an office building are an extension of the workplace and in fact the first indicator of the professional nature of those who occupy it. Grounds that are kept neat and orderly show pride by an owner or employer for employees, clients, and neighbors. Many times, outside grounds maintenance crews will need to be at work before normal work hours. Thus, they serve a vital function in the overall operation of the office building.

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CHAPTER 21

GENERAL FACILITIES (HYGIENE)



Well-cared-for restroom and hygiene facilities are critical to an office environment.

Although you may view this as a chapter on janitors, it is about more than just keeping office buildings clean. Office building hygiene starts with the design of the office building. You should ask yourself the following questions such as:

- Are enough restrooms planned?
- Are restrooms available for the public, visitors, and clients?
- Can you assure the safety and security of those using the restrooms?
- Do you have adequate space in restrooms or other rooms for anyone needing to recline and rest?
- Since health is an issue, are there adequate locker rooms and shower for active workers?

- Is there room for a wellness facility or workout room?
- Are lunchrooms planned to include running water and adequate space?
- Is a cafeteria or café planned?
- Are appropriate areas for the storage of custodial tools, equipment, and cleaning materials available?

HAZARDS

The hazards faced by custodial staff are usually not as many or in most cases are not as dangerous as for outside and inside maintenance staff. But, the potential for occupationally related injuries and illnesses should not be passed off as inconsequential. These workers are usually subject to the following types of hazards:

- Long and odd work hours.
- Potentially exposed to blood-borne pathogens.
- Cuts and punctures.
- Slips and falls.
- Strains and sprains from overexertion.
- Ladder mishaps.
- Equipment hazards.
- Electrocution working with water near electricity.
- Electrical shocks.
- Burns from hot objects and chemicals.
- Exposure to viruses, bacteria, airborne and waterborne biological agents, or communicable disease.
- Exposure to chemicals.

Since many custodial activities cannot be accomplished during normal work hours, these workers are often required to work in solitude with little or no supervision as they clean office buildings, offices and carpets, scrub floors, wax and buff floors, clean inside windows, and dispose of waste from the day's work. With this said, it is still critical to have enough custodial staff on duty during regular working hours to maintain a roving presence to react to spills and hygiene emergencies or maintain continuous tidiness (see Figure 21-1).

TRAINING

The custodial staff should be trained as thoroughly as the maintenance staff. They should be given training on:

- Blood-borne pathogens (providing access to the hepatitis B vaccine).
- Proper lifting techniques.



Figure 21-1. The presence of uniformed custodial personnel is important for continuous housekeeping as well as providing another pair of security eyes.

- Job-specific hazards.
- Chemical safety and hazard communications.
- Hygiene cleaning procedures.
- Use of personal protective equipment (PPE).
- Electrical safety.
- Safe use of motorized equipment.

CUSTODIAL CARE

Custodial care is a very important function as an integral part of your housekeeping initiative. The employer/owner helps to set the tone if cleanliness is stressed. You cannot expect workers to follow your cleanliness guidelines if you fail to set the example. Those responsible for the office building have custody of it and set and support good housekeeping practices.

AUDITS

Audits should be done to check performance to assure the degree of cleanliness you expect since the actual work often transpires after the normal work hours. The following is an example of an audit instrument that you can alter and use for your office building (see Figure 21-2).

AUDIT INSTRUMENT FOR HYGIENE FACILITIES		
Subject:	Results Yes/No	Action
Are washrooms and food preparation areas clean?		
Are the following provided adequately?		
<ul style="list-style-type: none">• Toilets.• Showers.• Potable water.• Clothing storage.• Change rooms.• Lunchrooms.		
Are measures in place to prevent the spread of disease?		
Restrooms:		
<ul style="list-style-type: none">• Is cleaning satisfactory?• Are toilet pans cracked?• Are hand sinks cracked?• Are toilet seats intact?• Are tiles intact?• Are water tanks working efficiently?• Is the sanitary disposal units adequate and collected regularly?• Are urinals clean?• Do floors have non-slip surface?• Is ventilation adequate?		
Are all waste containers easily located?		
Are bins emptied regularly?		
Are floors maintained and clean?		
Are “wet floor” signs in appropriate places?		
Are floor surfaces even, free from holes or cracks, free from fraying or uplifted edges?		
Are systems in place to ensure any spillages are cleaned up to prevent any possible accidents?		
Are mats in place for wiping feet?		

Figure 21-2. Audit instrument for hygiene facilities.

GUIDELINES FOR RESTROOMS, LOCKER ROOMS AND CAFETERIAS

Restrooms, locker rooms and cafeterias are provided as a convenience for all employees. Thus, it is imperative that all employees follow the rules as set forth, such as:

- Employees are expected to clean-up after themselves as a common courtesy to fellow employees.
- Flammable materials (fireworks, explosives, gasoline, etc.) may not be stored in lockers or brought into the office building.
- Personal food items are not to be stored in lockers or cafeteria overnight since pesticide treatments are often conducted at night in areas inhabited by workers in the daytime.
- All waste receptacles are to be lined with plastic trash bags to avoid direct contact while handling and custodial staff are to use rubber gloves and a compaction bar when handling waste.

A disinfectant selection chart can be found in Appendix F. This will be useful in assuring proper sanitation and cleaning in areas requiring such measures.

HYGIENE/CLEANING CHECKLIST

These are some of the main areas that need to be addressed when evaluating the effectiveness of your janitorial maintenance effort.

Maintenance Supplies

Maintenance supplies may emit air contaminants during use and storage. Products low in emissions are preferable. However, a product low in emissions is not necessarily better if it is more hazardous, despite the lower emissions, if it has to be used more often or at a higher strength. Examples of maintenance supplies that may contribute to indoor air quality (IAQ) problems include caulks, solvents, paints, adhesives, sealants, and cleaning agents (see Figures 21-3 and 21-4).



Figure 21-3. Inadequate storage of janitorial chemical cleaning supplies.



Figure 21-4. Normal cleaning supply cart. Notice the number of cleaning chemicals in use.

- Learn about your maintenance supplies:
 - Review and become familiar with your maintenance supplies.
 - Read labels and identify precautions regarding effects on indoor air or ventilation rate and requirements.
- Check to see if:
 - Supplies are reviewed and okay.
 - Help is needed determining impact of supplies.
 - If you make purchase decisions, or recommend product to purchase, confirm supplies are safe.
 - Ask vendors and manufacturers to help select the safest products available that can accomplish the job effectively.
- Check to see if:
 - Supplies are safe to use.
 - Help is needed to determine if supplies are safe.
- Follow good safety, handling, disposal and storage practices:
 - Develop appropriate procedures and have supplies available for spill control.
 - Exhaust air from chemical and trash storage areas to the outdoors.
 - Store chemical products and supplies in sealable, clearly labeled containers.

- Follow the manufacturers' instructions for disposal of chemicals, chemical-containing wastes, and containers.

Check to see if:

- Good safety, handling, disposal, and storage practices are followed.
- Safety, handling, storage, and disposal practices are being revised.
- Help is needed to perform good safety, handling, disposal, and storage practices.
- Establish maintenance practices that minimize occupants' exposure to hazardous materials:
 - Substitute less or non-hazardous materials where possible.
 - Schedule work involving odorous or hazardous chemicals for periods when the building is not occupied.
 - Ventilate during and after odorous or hazardous chemicals are used.

Check to see if:

- Procedures are established and followed to minimize occupant exposure.
- Help is needed to develop and implement procedures to minimize occupant exposure.

Dust Control

By reducing the amount of dust and dirt that enters a building, and by reducing the amount of dust that leaves vacuum bags and dust cloths, it will be possible to maintain a clean office building with less effort. A cleaner office building can also have positive physical and psychological effects on office workers and others. Complaints of illness and discomfort have been associated with buildings having high dust levels. In addition dust and other particles such as pollen that can cause allergic reaction will also be reduced.

- Purchase and maintain barrier floor mats for all office building entrances:
 - Barrier mats need to be long enough to allow five full steps for people entering the building. This allows dirt to be cleaned from the mats rather than having it spread all over the office building, saving cleaning costs.
 - Vacuum each barrier mat daily using a beater brush or beater bar vacuum; vacuum in two directions.

Check to see if:

- Barrier mats are purchase and maintained.
- Help is needed with barrier mats.
- Use higher efficiency vacuum bags:
 - Standard paper or cloth bags allow much dust to pass completely through the vacuum and back into the air and onto surfaces. Use

micro-filter bags that retain dust and particles in the 3 micron size range or smaller. Although the bags cost more, labor costs are reduced.

Check to see if:

- High efficiency bags are in use.
- Help is needed to obtain proper bags.
- Use proper dust wiping techniques:
 - Ensure that dust that has been collected remains on the wipe by using a wiping motion with a folded wipe, rather than a flicking motion with a crumpled-up wipe.
 - Wrap hand-held feather type dusters with a dust cloth. Use a wiping rather than a flicking or sweeping motion.

Check to see if:

- Proper dusting techniques are used.
- Help is needed with dust wiping.
- Vacuum dust from heating, cooling and ventilation air-return grilles and air-supply vents periodically:
 - In addition to vacuuming the grilles and vents using a soft bristle attachment, vacuum the ceiling and wall surfaces adjacent to the grilles and vents to remove visible dust.

Check to see if:

- Dusting is performed periodically.
- Help is need with dusting grilles and vents.

Floor Cleaning

All floors, including vinyl, wood, terrazzo, tile, and carpet, require daily attention to ensure cleanliness. In addition to the prevention technique of barrier mats as noted previously, follow specific guidelines of the Carpet and Rug Institute (CRI) for properly maintained carpets.

- Vacuum daily for soil removal. Use a vacuum with brusher, beater bars, strong suction, and a high efficiency filter bag that will filter particles down to the 3 micron or smaller range:
 - Remove spots and stains immediately, using the flooring manufacturer's recommended techniques. Use care to prevent excess moisture or accumulation of cleaning residue, and ensure that cleaned area will dry quickly.

Check to see if:

- Floors are cleaned daily as needed and moisture has been removed.
- Help with daily floor maintenance is needed.

- Perform restorative maintenance:
 - Apply the manufacturer's recommended guidelines when cleaning to remove accumulated contaminants. For carpet, CRI recommends periodic extraction cleaning, wet or dry, and complete removal of moisture and cleaning agents.

Check to see if:

- Restorative maintenance is properly performed as needed.
- Help is needed with restorative floor maintenance.

Sanitary Facilities

Restrooms, locker rooms, and lunchrooms need to be maintained in a sanitary condition on a daily basis. This requires both cleaning and housekeeping. These are used by office workers on a constant basis and may need to be tended to during the normal workday.

- Sanitizing restroom, locker room, and lunchrooms is usually accomplished by disinfecting chemicals and cleaning:
 - Use proper cleaning chemicals for sinks, toilets, showers, tables, and floors.

Check to see if:

- All fixtures are cleaned.
- All other areas have been sanitized.
- Help is needed in cleaning sanitary facilities.

- Removing waste is an important process in maintaining cleanliness:
 - All waste material should be removed from hygiene facilities.

Check to see if:

- All waste has been removed.
- Help is need in removing waste.

CLEANING CHEMICALS

Many of the chemicals used during janitorial tasks require chemicals to ensure that items (e.g., floors, toilets) are thoroughly cleaned and sanitized. This will require the use of chemicals that could be hazardous to workers. This is especially true if these chemicals are misused. A summary of cleaning chemicals can be found in Figure 21-5. You can find a listing of disinfectants in Appendix F.

CLEANING CHEMICALS			
Cleaning Agent	Common Ingredients	Dangers	Precautions
Bleach	Chlorine Sodium hydroxide Sodium carbonate Sodium hypochlorite	Can give off poisonous gases if used with other cleaners that contain ammonia. Could cause corrosive burns if swallowed but rarely deadly because it induces vomiting.	Never use with ammonia; it will release deadly chlorine gas.
Detergent (dishwashing)	Surface active agents (alkyl sulfonate) Phosphates Silicates Carbonates Sodium or potassium chloride	Phosphates cause water pollution. Enzymes can be highly irritating. Detergents are a major cause of nonfatal poisonings.	Use rubber gloves.
Detergent (laundry)	Phosphates Sodium carbonates Chlorine bleach Anionic and nonionic detergents	Phosphates cause waste pollution. Sodium carbonate is caustic and corrosive. Swallowing can cause nausea, vomiting, and diarrhea.	Don't expose to skin.
Disinfectants	Phenol compound Pine oils Iodophors	May irritate eyes and skin. May cause vomiting, nausea, and diarrhea if swallowed.	Don't use around food. Don't breathe fumes. Deadly if child swallows 1/5 of an ounce.
Drain cleaner	Lye Sodium nitrate Sodium chloride	The most dangerous product in home use. Penetrates mouth, stomach lining, and skin. There is no effective antidote.	Never use in a toilet, dishwasher, or garbage disposal. It can damage aluminum or plastic parts. It splashes back if put into water. Always store in locked cabinet.
Floor polish	Solvents Styrene copolymers Emulsifiers Carbitol or glycol Ammonia	Can irritate lungs and nasal passages, skin and eyes.	Use only in well-ventilated areas.

Furniture polish	Petroleum distillate solvents Wax Silicone Phenol compounds Some containing nitrosamines which cause cancer in laboratory animals.	Flammable. Aspiration of solvents can cause a fatal form of chemical pneumonia. A drop or two of certain solvents may be fatal if swallowed.	Use in well-ventilated area. Potential for poisoning greater when in liquid form. Use rubber gloves.
General purpose	Detergents Ammonia Ethylene glycol Ether solvents	Those containing petroleum distillates are most dangerous and can cause a fatal lung condition. Cleaners can irritate skin and eyes. Can burn throat and stomach linings if swallowed.	Never mix with chlorine bleach or other cleaning products containing chlorine. Use rubber gloves. Dilute the strength. Powders are safer than liquids.
Glass cleaner	Ammonia Alcohol Detergents	Swallowing can cause nausea, vomiting, can irritate eyes.	Keep away from food items.

Figure 21-5. Cleaning chemicals and their hazards.

SUMMARY

Many times the custodial services are contracted to a subcontractor to be performed by his/her employees. This should not be an invitation to accept poor performance for a low bid situation. The proper care of the office building will add to its value, its longevity, and its occupancy rate. Do not neglect this facet of the overall safety and health of your facility (see Figure 21-6).



Figure 21-6. The use of proper signage to help insure safety.

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CHAPTER 22

OFFICE BUILDING RENOVATION AND CONSTRUCTION



An office building renovated from an old factory.

From time to time for varied reasons office buildings will need to undergo demolition, renovation, or new construction activities. During normal use, deterioration of the office building's infrastructure occurs which makes the need to perform construction activities to upgrade different aspects of the office building (e.g., damage to floors) or supporting systems. There are occasions when the facing of the building needs to be replaced. New occupants may have unique requirements that may require both demolition and/or renovation to meet those needs (see Figure 22-1). Certain areas of an office building, depending upon its age, may require removal of asbestos or lead paint prior to other construction activities. Also, office buildings can be contaminated by chemical, biological, or radiological sources that will result in the use of special procedures to be used during the decontamination process.



Figure 22-1. Normal office renovation work.

SECURING A CONTRACTOR

In demolition, construction, renovation, removal, or decontamination activities, you will be securing the services of an outside contractor since you do not have the skills or expertise to undertake the project. These services from an outside source must be purchased from a reputable and qualified contractor. When securing a contractor you will need to:

- Assure the contractor has the ability to do the work necessary.
- Evaluate the contractor's safety and health record (do not accept a contractor with workers' compensation experience modification rate (EMR) above 1).
- Determine if the contractor has the license to perform the work needed.
- Check the other clients and references provided by the contractor (do not hire contractors if they fail to provide you with references from others who can verify the contractor's quality of work).
- Have a completed scope of agreement prior to starting the work. Anything added after the fact will increase your cost appreciably.
- Make sure the contractor has planned for the safety and health of the office building occupants.
- Make sure that contractors are responsible for the removal of any haz-

ards they create as well as left over waste or materials at the end of the job. This should be specified as part of the scope of work.

PROTECTING OFFICE WORKERS

You may have to take drastic action as a last resort to get the needed construction activities accomplished. This means the complete evacuation of the building or a partial evacuation of certain floors if those floors cannot be isolated from other floors. You might be able to barricade sections of individual floors or close specific office complexes while leaving others open to business. Physical barriers may not be the answer to isolating an area within the office building. So many factors will need to be considered when trying to protect the existing workforce. For example, the heating ventilation and air conditioning (HVAC) system will need to be isolated from the construction type of work.

It may be most advantageous and efficient to perform the work at night when no one or only a few workers are in the building. This keeps exposure of office workers to a minimum to construction-related activities.

Since most office workers are not accustomed to the hazards of construction work, they either need awareness training or to be barricaded or isolated from the construction hazards. Many construction activities have unique chemicals associated with them and could present an exposure hazard to office workers.

HAVE A PLAN

It is critical that any construction type activities be fully planned events to mitigate the amount of disruption to the office work environment. A planned approach to construction work will reduce losses due to accidents and property damage, as well as improving management of subcontractors. The main aspects of a planned approach should include:

- A project occupational safety and health plan.
- Coordination between the principal contractor and subcontractors.
- Communications between all levels of the workforce.
- Risk assessment and control before work is started.
- Consistently enforced occupational safety and health standards.
- Monitoring and correction of deficiencies as required.

Make sure the contractor has an occupational safety and health (OS&H) plan that includes the following:

- The assignment of responsibility and set levels of OS&H performance standards for managers, supervisors, and workers.
- A procedure in place to identify, assess and control all workplace hazards.
- A process to assure that all levels of involvement in OS&H matters from managers, supervisors, and workers occur.

- The provision for information, instruction and training to all levels so that all members of the workforce can effectively meet their responsibilities.
- A set of written goals and objectives for OS&H.

HAZARDS TO EXPECT

In the hazard identification process make sure contractors follow a process similar to the following steps:

- Consider the construction activity.
- Identify the potential hazards and avoid them if possible (see Figure 22-2).
- Assess the risk of injury or illness if they cannot remove the hazard.
- Check regulations to determine the applicability of any controls or standards of practice.
- Identify precautions to be taken and document them.
- Implement the most effective management and control procedures.
- Monitor and continuously evaluate the effectiveness of any mitigation strategy.



Figure 22-2. Many hazards come with construction activities.

During construction activities you could expect falls from heights, being struck by moving objects, tripping, structural collapse, material handling, electricity, hazardous substances, noise and vibration to be the principal causes of construction related injuries and deaths (see Figure 22-3). Many approaches can be used to mitigate these hazards.



Figure 22-3. During this type of construction activity, falls, struck-by, moving objects, tripping, structural collapse, or material handling incidents could occur.

Some of the most common controls are:

- Elimination of the hazards (e.g., removing tripping hazards or unneeded equipment).
- Substituting something of a lower hazard (e.g., using a fiberglass ladder rather than a metal ladder for electrical work) (see Figure 22-4).
- Isolate the hazard from the person (e.g., fence-off or barricade construction work from the office workforce or public).
- Engineering controls (e.g., guarding moving parts on equipment or machinery).
- Administrative controls (e.g., limit time of exposure to hazard).
- Personal protective equipment (e.g., use of gloves, protective eyewear, or hard hats).

ENSURE WORKERS ARE TRAINED

It is critical that the construction workers are adequately trained in order to protect themselves and the office workers in the office building. You should ask for



Figure 22-4. Construction worker using fiberglass ladder around electrical conductors.

documentation that the construction workers have been trained. You will find a company that documents training is more likely to be safety conscious. In general, the training topics that should be covered with construction workers are the following:

- Use and care of personal protective equipment.
- Use of portable fire extinguishers.
- Trenching and barricading.
- Safe work at heights.
- Scaffolding and guardrails.
- Electrical safety.
- Safe lifting practices.
- Safe use of ladders.
- Use of any special equipment or tools.
- Understanding material safety data sheets.
- Emergency and evacuation procedures.
- Availability of medical personnel and first aid supplies.
- Any specific OSHA regulations.
- Any special OS&H directives for this project.

Some of this training can be accomplished in the introduction to the project session and by the use of toolbox talks (short safety meeting) during the project as issues arise. But, untrained workers are usually more at risk to themselves and those around them. Training is an integral part of hiring a safety-conscious contractor.

OTHER INDICATORS OF SAFETY

Other indicators point to the safety and health record of the contractor. You will want to see records such as the following:

- Minutes of project OS&H management meetings.
- Minutes of OS&H committee meetings (if committee exist).
- Toolbox safety talk records.
- Specific safe operating procedures.
- List of company's safety and health rules.
- Training records.
- Records of OSHA inspections and citations.
- Emergency procedures.
- List of hazardous chemicals used.
- Worksite inspection checklist and records.
- Material safety data sheets.
- Records of workers' certifications or qualifications for specific work activities.
- First aid log.
- Accident investigation procedures.
- Accident/incident reports.
- Listing of work-related injuries and illnesses for at least two years.

MINIMIZING DISRUPTIONS

If office workers are going to continue to work during office building construction activities, the following safety guards should be maintained during the construction operations:

- Operation of fire suppression system.
- Electrical service.
- Escape ways and exits not blocked.
- Emergency alarms.
- Good housekeeping.
- Sanitary facilities with water supply.

- Drinking water supply.
- Safe walking surfaces.
- HVAC systems for air quality.

These will help minimize the disruption to the continuation of normal office work during the construction activities. Often it is critical that these two workforces coexist at the same time and much can be done to assure that this happens in the most expeditious way.

COMMUNICATIONS

Open communication is critical anytime there is change occurring. Everyone is reticent to change and suspects the outcomes. Construction activities are a change in the work environment. It is a good idea to have the construction manager meet with office employees to address their concerns and questions. The more open that all involved in the construction project are, the better the communications and the less fear of this unknown invader to the workplace. Communication will go a long way toward mitigating concerns relevant to the potential effects of the construction work that will be performed.

Keep everyone aware of the schedule and any changes that have to be made in the schedule. No one likes to be left out of a process that affects them personally or impacts them.

SUMMARY

Selecting a contractor to perform construction activities on an office building should not be taken lightly since the safety and health of the construction workers, office workers, and public must be taken into consideration. The construction work should be accomplished in the safest of ways so that the least possible risk exists to any workers in the building.

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CHAPTER 23

OFFICE BUILDING SECURITY



So many office buildings, so many security needs

Office building security issues are not much different than those for any other workplace environment. Granted each workplace has its unique hazards that need to be addressed in order to effectively provide the protection that every worker should expect in the place of employment. Employers can be liable for not providing adequate security for their workforce.

Injured workers are increasingly suing employers and/or the employer's contract security guard service for failing to protect them from reasonably foreseeable assaults and injuries. While workers' compensation laws bar injured workers from suing their employers directly in many states, they do not bar all such lawsuits.

It seems that it is safe to say that no security program is foolproof and cannot be breached. You need to balance the degree of risk with the cost and determine the amount of security that you are willing to provide.

DESIGNING THE OFFICE BUILDING

It is important that the construction of an office building include any built-in security measures such as wiring for alarms, surveillance systems, and access systems. It is much easier and more cost effective to have evaluated your security needs and have any security wiring, equipment, cameras, closed circuit television, access systems, or guards such as fencing as a part of the original construction process. Good planning will go a long way toward providing a secure workplace (see Figure 23-1).



Figure 23-1. Office building with security fence and guarded entrance.

SECURITY PROGRAM

A written security program should be part of the planning process. The formal program provides for responsibility, compliance, communications, hazard assessment, incident investigation, hazard control, and training and instruction. The major elements of a security program are the same as for any safety and health program. They are as follows:

- **Management Commitment and Employee Involvement**—Management must make a commitment in writing, in actions, in finances, and in support of security. For the plan to be most effective, employees need to be involved since they are the primary entity that you are trying to support.
- **Hazard Identification**—Each office building is different and the potential risk is varied. So an assessment must be done to identify the security issues with each operation.
- **Hazard Control, Prevention and Intervention**—Engineering and administrative controls can usually be instituted to address security issues. This can be accomplished by electronic access systems or security guards, for an example.

- **Training and Education**—All personnel from security personnel, managers, supervisors, and employees must be trained to protect themselves and others as necessary and in order to adhere to security policies and maintain a secure office building.

SECURITY FORCE

Creating a security workforce requires a much more professional group than was acceptable in the past. Not only do these individuals patrol buildings and monitor surveillance systems, but they must be familiar with all of a building's systems for assessing and containing potential threats. Security personnel are your most visible deterrent in an office building. As a uniformed force, they must be considered credible and exercise judgment in critical situations. They must stay current with the changes in security, have standards of conduct, become certified when appropriate, be adequately trained, and be capable of responding in a responsible way to an incident following a standard protocol. Hiring of security personnel cannot be viewed as a nominal task. The security workforce is your first line of defense and must be held to a higher quality standard than a watchman.

HAZARD IDENTIFICATION AND ANALYSIS

Worksite hazard identification/analysis identifies existing hazards and conditions, operations and situations that create or contribute to hazards, and areas where hazards may develop. This includes close scrutiny and tracking of injury/illness and incident records to identify patterns that may indicate causes of aggressive behavior and assaults. The objectives of worksite hazard identification/analyses are to recognize, identify, and plan to correct security hazards. Analysis utilizes existing records, and worksite evaluations should include record review and identification of security hazards.

In searching out the potential hazards you will need to answer the following questions before you can take the needed security actions:

- Does your parking area have adequate lighting?
- Is there adequate lighting near all entrances and exit doors/areas?
- Are your windows consistently cleaned and clear?
- Is there an unobstructed view of business entry areas and parking lots?
- Is your business open 24 hours a day? If so, can you close and lock if necessary?
- If you have a side-building ladder, can it be locked?
- Do you make use of alternate access control devices such as magnet locks?
- Are interior doors locked when not in use?
- Is there a secure area for employees to lock their personal belongings?
- Do you have an alarm system?

- Do you regularly go over procedures on operating and testing the alarm system?
- Do you use video equipment throughout the premises?
- Do you maintain low cash quantities at all times and make use of a drop safe or similar system?
- Do you have an emergency operations plan?
- Have you discussed your emergency operations plan with your employees?
- Have you established an incident-reporting system/procedure so all employees are made aware of suspicious situations?
- Do you regularly meet with staff to discuss risk assessment or concerns?
- Are visitor policy and procedures in place? They might consist of sign-in logs, visitor badges, and escorts.
- Do you have an after-hours work policy, such as providing escorts to vehicles?
- Do you have a policy of refusing to provide personal staff information to anyone who asks?
- Do you participate in a business watch program?
- Does your office building have terrorist insurance?
- Is your building a “trophy” building or are you or your office neighbors “trophy tenants”? (Trophy targets are high-profile buildings such as the Empire State Building in New York City).
- Does the landlord have the right to provide some level of “access control”? Will this affect the ability of your customers to come to your business and do you have any say in how this access control is undertaken?
- Can your landlord pass on all increased security upgrades to the tenants?
- Has your landlord given you a copy of the emergency evacuation plan, conducted drills; do you have a “floor warden”?
- If your building has an underground garage, how vulnerable is it?
- How vulnerable is your building’s HVAC intakes to potential nuclear, chemical or biological exposure?
- How are deliveries and delivery vehicles monitored?

Identification of Security Hazards

Worksite hazard identification/analysis should use a systematic method to identify those areas needing in-depth scrutiny of security hazards. This analysis should do the following:

- Identify those work positions in which workers are at risk of assaultive behavior.
- Use a checklist for identifying high risk factors, including components such as type of people contacts, physical risk factors of the building, isolated locations/job activities, lighting problems, high risk activities or

situations, problem workers, service/delivery personnel or customers, uncontrolled access, and areas of previous security problems.

- Identify low risk positions for light or relief duty or restricted activity work positions when injuries do occur.
- Determine if risk factors have been reduced or eliminated to the extent feasible. Identify existing programs in place, and analyze effectiveness of those programs, including engineering control measures and their effectiveness.
- Apply analysis to all newly planned and modified facilities, or any public services programs to ensure that hazards are reduced or eliminated before involving the public, customers, or employees.
- Conduct periodic surveys at least annually (or whenever there are operation changes) to identify new or previously unnoticed risks and deficiencies, and to assess the effects of changes in the building's design, work processes, patient services and security practices. Evaluation and analysis of information gathered, and incorporation of all this information into a plan of correction and ongoing surveillance, should be the result of the worksite analysis.

HAZARD PREVENTION AND CONTROL

Select work settings to apply methods of reducing hazards. You will need to make use of general engineering concepts, specific engineering and administrative controls, work practice controls and personal protective equipment as appropriate to control hazards.

General Building, Workstation and Area Designs

Workplace designs are appropriate when they provide secure, well-lighted protected areas, which do not facilitate assaults or other uncontrolled activity.

- Design of facilities should ensure uncrowded conditions for workers and customers. Areas for privacy and protection are needed, although isolation should be avoided. For example, doors must be fitted with windows so that other workers can view any aberrant behavior.
- Work areas should be designed and furniture arranged to prevent entrapment of the workers and/or others.
- Reception areas should be protected by enclosures that prevent molesting, throwing objects, reaching into the work area or otherwise creating a hazard or nuisance to the worker; such barriers should not restrict communication but should be protective.
- Lockable and secure bathroom facilities and other amenities must be provided for workers separate from customer or public restrooms.
- Public or customer access to workers' workstations and other facility areas must be controlled; that is, doors from waiting rooms must be locked

and all outside doors locked from the outside to prevent unauthorized entry, but permit exit in cases of emergency or fire.

- Metal bars or protective decorative grating on outside ground level windows should be installed (in accordance with fire department codes) to prevent unauthorized entry.
- Bright and effective lighting systems must be provided for all indoor building areas as well as grounds around the facility or workplace, especially in the parking areas.
- Curved mirrors should be installed at intersections of halls or in areas where an individual may conceal his or her presence.
- All permanent and temporary employees who work in secured areas should be provided with keys or swipe cards to gain access to work areas whenever on duty.
- Metal detectors should be installed to screen visitors, customers, service personnel, and visitors in high security areas. In other situations implement hand-held metal detectors to use in identifying weapons.
- If the lobby area is a waiting area that limits access from visitors and others to the actual work areas as a security measure. The lobby should have accessible restrooms and public telephones to preclude the need for those waiting to enter secure areas due to lack of facilities.

Maintenance

Maintenance must be an integral part of any safety and security system. Prompt repair and replacement programs are needed to ensure the safety of workers and customers. Replacement of burned-out lights, broken windows, etc. is essential to maintain the system in safe operating condition.

If an alarm system is to be effective, it must be used, tested, and maintained according to strict policy. Any personal alarm devices should be carried and tested as required by the manufacturer and facility policy. Maintenance on personal and other alarm systems must take place monthly. Batteries and operation of the alarm devices must be checked by a security office to insure the function and safety of the system. Any mechanical device utilized for security and safety must be routinely tested for effectiveness and maintained on a scheduled basis.

Engineering Controls

Alarm systems are imperative for use in psychiatric units, hospitals, mental health clinics, high hazard areas, emergency rooms, or where drugs are stored. Whereas alarm systems are not necessarily preventive, they may reduce serious injury when a person is acting in an abusive manner or threatening with or without a weapon. Many other engineering controls can be utilized such as the following:

- Alarm systems which rely on the use of telephones, whistles or screams are ineffective and dangerous. A proper system consists of an electronic device that activates an alert to a dangerous situation in two ways, visually and audibly. Such a system identifies the location of the room or

action of the worker by means of an alarm sound and a lighted indicator, which visually identifies the location. In addition, the alarm should be sounded in a security (or other response team) area in order to summon aid. This type of alarm system typically utilizes a pen-like device, which is carried by the employee and can be triggered easily in an emergency situation. Back-up security personnel must be available to respond to the alarm.

An emergency personal alarm system is of the highest priority. An alarm system may be of two types: the personal alarm device or the type that is triggered at a desk or counter. This desk system may be silent at the desk or counter, but audible in a central assistance area. It must clearly identify the location in which the problem is occurring.

These alarm systems must be relayed to security, police or locations where assistance is available 24 hours per day. A telephone link to the local police department should be established in addition to other systems (see Figure 23-2).



Figure 23-2. Keypad for disarming internal alarm system.

“Panic buttons” are needed at times when someone is confronted with an abusive person. Any such alarm system may incorporate a telephone paging system in order to direct others to the location of the disturbance, but alarm systems must not depend on the use of a telephone to summon assistance (see Figure 23-3).



Figure 23-3. A call box and panic button for parking area emergencies.

Video screening of high-risk areas or activities may be of value and permits one security guard to visualize a number of high-risk areas, both inside and outside the building. Closed circuit TV monitors may be used to survey concealed areas or areas where problems may occur. The surveillance cameras that are seen in banks and convenience stores are not the modern ones usually found in office buildings. The new cameras are less visible when mounted and about the size of a teacup or small bowl (see Figure 23-4).

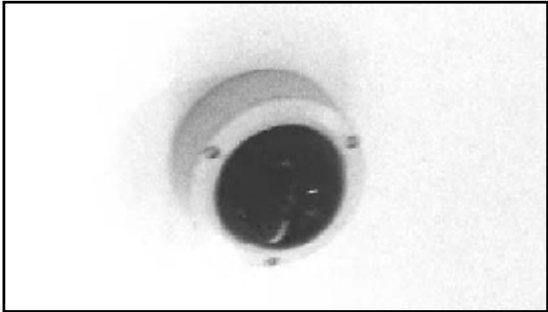


Figure 23-4. Example of a small security camera.

Other devices, equipment, and materials that may be an integral part of a good security approach are:

- Metal detection systems, such as hand-held devices or other systems to identify persons with hidden weapons, should be considered. These systems are in use in courts, boards of supervisors, some departments of public social service, schools and emergency rooms. Although controversial, the fact remains that many people, including homeless and mentally ill persons, carry weapons for defense while living on the streets. Some system of identifying persons who are carrying guns, knives, ice picks, screwdrivers, etc. may be useful and should be considered when situations merit them. Signs posted at the entrance will notify workers, customers, and visitors that screening will be performed.
- Reception areas should be designed so that receptionists and staff may be protected by safety glass and locked doors to their work areas.
- First aid kits should be available.
- Materials and equipment to meet the requirements of the blood-borne pathogen standard should be available.
- Strictly enforced limited access to work areas is needed to eliminate entry by unwanted or dangerous persons to enter. Doors may be locked or key-coded (see Figure 23-5).



Figure 23-5. This is a swipe card entry area that limits access to authorized individuals.

- In order to provide some measure of safety and to keep the employee in contact with headquarters or another source of assistance, cellular phones should be installed/provided for official use when workers are assigned to duties that take them into private homes and the community. These workers may include (to name a few) parking enforcers, union business agents, psychiatric evaluators, public social service workers, children's service workers, visiting nurses and home health aides.
- Hand-held alarm or noise devices or other effective alarm devices are highly recommended to be provided for all field personnel.
- Beepers or alarm systems should be investigated and provided to alert a central office of problems.

- Other protective devices such as pepper spray should be investigated and provided.

Administrative Controls and Work Practices

A sound overall security program includes administrative controls that reduce hazards from inadequate staffing, insufficient security measures and poor work practices.

- Employees are to be instructed not to enter any location where they feel threatened or unsafe. This decision must be the judgment of the employee. Procedures should be developed to assist the employee to evaluate the relative hazard in a given situation. In hazardous cases, the managers must facilitate and establish a “buddy system.” This “buddy system” should be required whenever an employee feels insecure regarding the time of activity, the location of work, the nature of the individuals in that location and past history of aggressive or assaultive behavior by these individuals.
- Employers must provide a program of personal safety education for the field staff. This program should be at the minimum, one provided by local police departments, or other agencies. It should include training on awareness, avoidance, and action to take to prevent mugging, robbery, rapes and other assaults.
- Procedures should be established to assist employees to reduce the likelihood of assaults and robbery from those seeking drugs or money, as well as procedures to follow in the case of threatening behavior and provision for a fail-safe back-up in administration offices.
- A fail-safe back-up system is provided in the administrative office at all times of operation for employees in the field who may need assistance.
- All incidents of threats or other aggression must be reported and logged. Records must be maintained and utilized to prevent future security and safety problems.
- Police assistance and escorts should be required in dangerous or hostile situations or at night. Procedures for evaluating and arranging for such police accompaniment must be developed and training provided.
- Security guards must be provided. These security guards should be assigned to areas where there may be problems such as emergency rooms or psychiatric services.
- In order to staff safely, a written guideline should be established that evaluates the level of staff or worker coverage needed. Provision of sufficient staff interaction and clinical activity is important because patients/clients need access to medical assistance from staff. Possibility of violence often threatens staff when the structure of the patient/nurse relationship is weak. Therefore, sufficient staff members are essential to allow formation of therapeutic relationships and a safe environment.
- It is necessary to establish on-call teams, reserve or emergency teams of staff who may provide services, such as responding to emergencies, trans-

portation or escort services, dining room assistance, or many of the other activities where potential hazards exist.

- Methods should be developed to communicate to workers who are coming to work about any potential security breaches or violence potentials.
- Workers should be instructed to limit physical intervention in altercations whenever possible, unless there are adequate numbers to assist them, or emergency response teams, and security is called. In a case where serious injury could occur, emergency alarm systems should always be activated. Administrators need to give clear messages to everyone that violence is not permitted and that legal charges will be pressed when violence or the threat of it occurs. Management should provide information to workers who may be in danger. Policies must be provided with regard to safety and security of workers regarding confronting or querying unrecognized individuals in the workplace, key and door opening policy, open vs. locked seclusion policies, and evacuation policy in emergencies.
- Escort services by security should be arranged so that workers should not have to walk alone in parking lots or other parking areas in the evening or late hours.
- Visitors and maintenance persons or crews should be escorted and observed while in any locked or secure facility. Often they have tools or possessions, which could be inadvertently left unattended, and thus could become weapons.
- Management needs to work with local police to establish liaison and response mechanisms for police assistance when calls are made for help. Management should also make clear policies on how they wish the workers to respond.
- It is not wise to allow workers to confront an aggressive or threatening individual, nor is it appropriate to allow aggressive behavior to go unchecked. Workers should respond according to the company's policy and procedures.
- It is a wise policy to require badging of all workers and require them to visibly wear their picture badges at all times. Anyone who does not have a badge in restricted work areas should be confronted, reported to the supervisor or security should be called.
- Security guards trained in principles of human behavior and aggression should be provided where there are large numbers of customers, clients, patients, or visitors. Guards should be provided where there may be psychologically stressed clients or persons who have taken hostile actions, such as in emergency facilities, hospitals where there are acute or dangerous patients, or areas where drug or other criminal activity is commonplace.
- No employee should be permitted to work or stay alone in an isolated area without protection from some source.
- Clothing and apparel should be worn which will not contribute to injury such as low heeled shoes, use of conservative earrings or jewelry, and clothing that is not provocative.

- Keys should be kept covered and worn in such a manner to avoid incidents, yet be available.
- All protective devices and procedures should be required to be used by all workers.
- After dark, all unnecessary doors should be locked, and access into the workplace should be limited and patrolled by security.
- Emergency or hospital staff who have been assaulted should be permitted and/or assisted to request police assistance or file charges of assault against any customer, client, visitor, patient or relative who injures, just as a private citizen has the right to do so. Being at work does not reduce the right of pressing charges or damages.
- Visitors should sign in and out and have an issued pass that identifies them as visitors and specifies the locations they are permitted to access in the workplace.

TRAINING AND EDUCATION

A major program element in an effective safety and security program is training and education. The purpose of training and education is to ensure that employees are sufficiently informed about the safety and security hazards to which they may be exposed and thus are able to participate actively in their own and their co-workers protection. All employees should be periodically trained in the employer's safety and security program.

Training and education are critical components of a safety and security program for employees who are potential victims of assaults. Training allows managers, supervisors, and employees to understand security and other hazards associated with a job or location within the facility, the prevention and control of these hazards, and the medical and psychological consequences of assault.

A training program should include all affected employees who could encounter or be subject to abuse or assaults. This means all employees: engineers, security officers, maintenance personnel, supervisors, managers, and workers at all levels.

- The program should be designed and implemented by qualified persons. Appropriate special training should be provided for personnel responsible for administering the training program.
- Several types of programs are available and have been utilized, such as management of assaultive behavior (MAB), professional assault response training (PART), police department assault avoidance programs or personal safety training. A combination of such training may be incorporated depending on the severity of the risk and assessed risk. These management programs must be provided and attendance required at least yearly. Updates may be provided monthly/quarterly.
- The program should be presented in the language and at a level of understanding appropriate for the individuals being trained. It should provide an overview of the potential risk of illness and injuries from assault, the

causes and early recognition of escalating behavior or recognition of situations that may lead to assaults. The means of preventing or defusing volatile situations, safe methods of restraint or escape, or use of other corrective measures of safety devices that may be necessary to reduce injury and control behavior are critical areas of training. Methods of self protection and protection of co-workers, the proper treatment of staff and patient procedures, recordkeeping, and employee rights need to be emphasized.

- The training program should also include a means for adequately evaluating its effectiveness. The adequacy of the frequency of training should be reviewed. The whole program evaluation may be achieved by using employee interviews, testing and observing and/or reviewing reports of behavior of individuals in situations that are reported to be threatening in nature.
- Employees who are potentially exposed to safety and security hazards should be given formal instruction on the hazards associated with the unit of job and facility. This includes information on the types of injuries or problems identified in the facility, the policy and procedures contained in the overall safety program of the facility, those hazards unique to the unit or program, and the methods used by the facility to control the specific hazards. The information should discuss the risk factors that cause or contribute to assaults, etiology of violence and general characteristics of violent people, methods of controlling aberrant behavior, methods of protection, and reporting procedures and methods to obtain corrective action.

Training for affected employees should consist of both general and specific job training. "Specific job training" is contained in the following section or may be found as safe operating procedures which can be classified as administrative controls when specific work locations are denoted in the security plan.

Job-Specific Training

New employees and reassigned workers should receive an initial orientation and hands-on-training prior to being placed in a treatment unit or job. Each new employee should receive a demonstration of alarm systems, protective devices, and the required maintenance schedules and procedures. The training should also contain the use of administrative or work practice controls to reduce injury.

Initial Training Program

The initial training program should include:

- Care, use and maintenance of alarm tools and other protection devices.
- Location and operation of alarm systems.
- MAB, PART, or other training.
- Communication systems and treatment plans.
- Policies and procedures for reporting incidents and obtaining medical care and counseling.

- Hazard communication program.
- Blood-borne pathogen program, if applicable.
- Rights of employees, treatment of injury and counseling programs.

On-the-job training should emphasize employee development and use of safe and efficient techniques, methods of de-escalating aggressive behavior, self-protection techniques, methods of communicating information that will help other staff to protect themselves and discussions of rights of employees in the work setting.

Specific measures at each location, such as protective equipment, location and use of alarm systems, determination of when to use the buddy system and so on as needed for safety, must be part of the specific training. Training co-workers from the same unit and shift may facilitate teamwork in the work setting.

Training for Supervisors and Managers, Maintenance and Security Personnel

Supervisors and managers are responsible for ensuring that employees are not placed in assignments that compromise safety and that employees feel comfortable in reporting incidents. They must be trained in methods and procedures that will reduce the security hazards and train employees to behave compassionately with co-workers when an incident does occur. They need to ensure that employees have safe work practices and receive appropriate training to enable them to do this. Supervisors and managers, therefore, should undergo training comparable to that of the employee and such additional training as will enable them to recognize a potentially hazardous situation, changes needed in the program, staffing policy and procedures, or other such situations that contribute to hazardous conditions. They should be able to reinforce the employer's program of safety and security, assist security guards when needed and train employees as the need arises.

Training for engineers and maintenance should consist of an explanation or a discussion of the general hazards of violence, the prevention and correction of security problems and personal protection devices and techniques. They need to be acutely aware of how to avoid creating hazards in the process of their work.

Security personnel need to be recruited and trained whenever possible for the specific job and facility. Security companies usually provide general training on guard or security issues. However, specific training should include psychological components of handling aggressive and abusive individuals, types of disorders, the psychology of handling aggression and defusing hostile situations. If weapons are utilized by security staff, special training and procedures need to be developed to prevent inappropriate use of weapons and the creation of additional hazards.

MEDICAL MANAGEMENT

A medical program that provides knowledgeable medical and emotional treatment should be established. This program should ensure that victimized employees are provided with the same medical care that is shown to the perpetrator. Violence is a major safety hazard in psychiatric and acute care facilities, emergency rooms, homeless shelters, and other health care settings. Medical and emotional evaluation and treatment are frequently needed but often difficult to obtain.

The consequences to employees who are abused by others may include death or severe, life-threatening injuries, in addition to short and long-term psychological trauma, post traumatic stress, anger, anxiety, irritability, depression, shock, disbelief, self-blame, fear of returning to work, disturbed sleep patterns, headache, and change in relationships with co-workers and family. All these symptoms or warning signs have been reported by workers after assaults, particularly if the attack has come without warning. They may also fear criticism by managers, increase their use of alcohol and medication to cope with stress, suffer from feelings of professional incompetence, physical illness, powerlessness, increase absenteeism, and experience performance difficulties.

Managers and supervisors have often ignored the needs of the physically or psychologically abused or assaulted staff, requiring them to continue working, obtain medical care from private medical doctors, or blame the individual for irresponsible behavior. Injured staff must have immediate physical evaluations, be removed from the unit and treated for acute injuries. Referral should be made for appropriate evaluation, treatment, counseling and assistance at the time of the incident and for any required follow-up treatment. Medical services include:

- Provision of prompt medical evaluation and treatment whenever an assault takes place regardless of severity. A system of immediate treatment is required regardless of the time of day or night. Injured employees should be removed from the unit until order has been restored. Transportation of the injured to medical care must be provided if it is not available on-site or in an employee health service. Follow-up treatment must be provided at no cost to employees.
- A trauma-crisis counseling or critical incident debriefing program must be established and provided on an on-going basis for staff who are victims of assaults. This counseling program may be developed and provided by in-house staff as part of an employee health service, by a trained psychologist, psychiatrist, or other clinical staff members such as a clinical nurse specialist, or a social worker. A referral may also be made to an outside specialist. In addition, peer counseling or support groups may be provided. Any counseling provided should be by well-trained psychosocial counselors whether through an employee assistance program, in-house programs, or by other professionals away from the facility who must understand the issues of assault and its consequences.
- Reassignment of staff should be considered when assaults have taken place. At times it is very difficult for staff to return to the same unit to face the assailant. Assailants often repeat threats and aggressive behavior, and actions need to be taken to prevent this from occurring. Staff development programs should be provided to teach staff and supervisors to be more sensitive to the feelings and trauma experienced by victims of assaults. Some professionals advocate joint counseling sessions including the assaultive client and staff member to attempt to identify the motive when it occurs in inpatient facilities and to defuse situations that may lead to continued problems.
- Other workers should also receive counseling to prevent “blaming the victim syndrome” and to assist them with any stress problems they may

be experiencing as a result of the assault. Violence often leaves staff fearful and concerned. They need to have the opportunity to discuss these fears and to know that administration is concerned and will take measures to correct deficiencies. This may be called a defusing or debriefing session, and unit staff members may need this activity immediately after an incident to enable them to continue working. First aid kits or materials must be provided on each unit or facility.

- The replacement and transportation of the injured workers must be provided for at the earliest possible time. Do not leave the workplace understaffed in the event of an assault. The development of an employee health service, staffed by a trained occupational health specialist, may be an important addition to the hospital team. Such employee health staff can provide treatment, arrange for counseling, refer to a specialist and should have procedures in place for all shifts. Employee health nurses should be trained in post traumatic counseling and may be utilized for group counseling programs or other assistance programs.
- Legal advice regarding pressing charges should be available, as well as information regarding workers compensation benefits, and other employee rights must be provided regardless of apparent injury. If assignment to light duty is needed or disability is incurred, these services are to be provided without hesitation. Reporting to the appropriate local law enforcement agency and assistance in making this report is to be provided. Employees may not be discouraged or coerced when making reports or workers' compensation claims.
- All assaults must be investigated, reports made and needed corrective action determined. However, methods of investigation must be such that the individual does not perceive blame or criticism for assaultive actions taken by the attacker. The circumstances of the incident or other information that will help to prevent further problems needs to be identified, but not to blame the worker for incompetence and compound the psychological injury which is most commonly experienced.

RECORD-KEEPING

Within the major program elements, record-keeping is the heart of the program, providing information for analysis, evaluation of methods of control, severity determinations, identifying training needs and overall program evaluations.

Records shall be kept of the following:

- OSHA 300 log. OSHA regulations require entry on the Injury and Illness Log of any injury that requires more than first aid, is a lost-time injury, requires modified duty, or causes loss of consciousness. Assaults should be entered on the log. Doctors' reports of work injury and supervisors' reports shall be kept of each recorded assault.
- Incidents of abuse, verbal attacks or aggressive behavior that may be threatening to the worker but not result in injury, such as pushing, shouting, or acting aggressively toward other clients requiring action by staff,

should be recorded. This record may be an assaultive incident report or documented in some other manner that can be evaluated on a monthly basis by the department's safety committee.

- A system of recording and communicating should be developed so that all workers who may provide care for escalating or potentially aggressive, abusive or violent individual will be aware of the status of those individuals and of any problems experienced in the past. This information regarding history of past violence should be noted on those individuals' records, communicated in shift-change reports and noted in an incident log.
- An information gathering system should be in place that will enable incorporation of past history of violent behavior, incarceration, probation reports or any other information that will assist health care staff to assess violence status. Employees are to be encouraged to seek and obtain information regarding history of violence whenever possible.
- Emergency room staff should be encouraged to obtain and record, from police and relatives, information regarding drug abuse, criminal activity or other information to adequately assist in assessing a patient. This would enable them to appropriately house, treat and refer potentially violent cases. They should document the frequency of admission of violent clients or hostile encounters with relatives and friends.
- Records need to be kept concerning assaults, including the type of activity, e.g., unprovoked sudden attack, patient-to-patient altercation, and management of assaultive behavior actions. Information needed includes who was assaulted, and circumstances of the incident without focusing on any alleged wrongdoing of staff persons. These records also need to include a description of the environment, location or any contributing factors, corrective measures identified, including building design, or other measures needed. Determination must be made of the nature of the injuries sustained, whether severe, minor or the cause of long-term disability, and the potential or actual cost to the facility and employee. Records of any lost time or other factors that may result from the incident should be maintained.
- Minutes of the safety meetings and inspections shall be kept. Corrective actions recommended as a result of reviewing reports or investigating accidents or inspections need to be documented with the management's response and completion dates of those actions should be included in the minutes and records.
- Records of training program contents and sign-in sheets of all attendees should be kept. Attendance records of all training should be retained. Qualifications of trainers shall be maintained along with records of training.

EVALUATION OF THE PROGRAM

Procedures and mechanisms should be developed to evaluate the implementation of the safety and security programs and to monitor progress and accom-

plishments. Top management and supervisors should review the program regularly. Semiannual reviews are recommended to evaluate success in meeting goals and objectives. Evaluation techniques include some of the following:

- Establishment of a uniform reporting system and regular review of reports.
- Review of reports and minutes of safety and security committee.
- Analyses of trends and rates in illness/injury or incident reports.
- Surveys of employees.
- Before and after surveys/evaluations of job or worksite changes or new systems.
- Up-to-date records of job improvements or programs implemented.
- Evaluation of employee experiences with hostile situations and results of medical treatment programs provided. Follow-up should be repeated several weeks and several months after an incident.
- Results of management's review of the program should be a written progress report and program update that should be shared with all responsible parties and communicated to employees. New or revised goals arising from the review identifying jobs, activities, procedures and departments should be shared with all employees. Any deficiencies should be identified and corrective action taken. Safety of employees should not be given a lesser priority than client safety as they are often dependent on one another. If it is unsafe for employees, the same problem will be the source of risk to other clients or patients.
- Managers and supervisors should review the program frequently to re-evaluate goals and objectives and discuss changes. Regular meetings with all involved, including the safety committee, union representatives and employee groups at risk, should be held to discuss changes in the program.

If you are to provide a safe work environment, it must be evident from managers, supervisors, and peer groups that hazards from violence will be controlled. Employees in psychiatric facilities, drug treatment programs, social services, customer relations, human resource management, emergency rooms, law enforcement, service industries, convalescent homes, taxis, community clinics or community settings are to be provided with a safe and secure work environment and injury from assault is not to be accepted, tolerated or considered "part of the job."

Procedures and mechanisms should be developed to evaluate the implementation of the security program and to monitor progress. This evaluation and record-keeping program should be reviewed regularly by top management and the medical management team. At least semiannual reviews are recommended to evaluate success in meeting goals and objectives.

SUMMARY

All office buildings are not alike, either in design or structure, and thus security concerns will vary also. Single-tenant office buildings (corporate headquar-

ters) are subject to different security issues and risk than multi-tenant/single-use buildings, such as a medical office building with many tenants in the same type of business. A still different situation exists for multi-tenant/multi-use building which may have many different tenants doing many different type of business, possibly including general office types, retail operations, public use (social services), and government agencies all mixed together.

There is not one approach for an office building that can be applied to all office buildings. Management of each building will have to identify its own security needs, starting by conducting a risk assessment. How likely a target is your building to criminal intent or terrorist? What you want to do is to make sure that either of these would not gain from an act upon your building. You want security enough to deter them from attempting anything with or within your office building.

In a commercial office building, general security risks may include murder, robbery, rape, assault, theft, commercial espionage, arson, vandalism, bomb threats and sabotage, to name a few. The heavy concentration of people and property, coupled with the increasingly open-floor plans, makes modern office buildings susceptible to these types of threats.

Management is responsible for securing its office building to protect the property and those within it from harm. This means that once an assessment is completed, action must be taken to mitigate the potential risk.

There are some fairly simple steps to take to provide office-building security. They are as follow:

- Don't prop open or compromise office building entrances/doors/windows. These should be closed when observed.
- Account for and secure keys, don't leave them unattended, or give to unauthorized persons. All lost keys should be reported immediately.
- Account for and secure all sensitive material/information when it is not in use.
- Account for and secure all sensitive deliveries in a timely manner.
- Secure all areas when not attended.
- Be aware of unfamiliar persons or visitors in any office areas.
- Protect access codes, combinations, and cards, change codes regularly. Report compromised codes to the proper security personnel.
- Be prepared: take time to familiarize yourself with building evacuation plans and routes.
- Report suspicious tampering with physical security (e.g., doors, locks, camera).
- Talk with co-workers; know what is out-of-place (e.g., unclaimed items, boxes).
- Ensure anyone who works after hours has proper permits.

In order to determine the quality of your security you might want to use the checklist found in Figure 23-6. This checklist may assist you in evaluating your security effort.

OFFICE BUILDING SECURITY CHECKLIST

Security Plan

- ☐ Is there a security plan? Does it contain:
 - ☐ A policy statement?
 - ☐ Protection of assets?
 - ☐ Reporting procedures?
 - ☐ Record-keeping procedures?
 - ☐ Counseling?
 - ☐ Evaluation of incidents?
 - ☐ Computer security?
- ☐ Proprietary information security?
- ☐ Plan accessible to all employees?
- ☐ Plan provided to new hires?
- ☐ Plan reviewed and updated annually?
- ☐ Plan reviewed and updated when tasks are added or changed?
- ☐ Is policy statement provided by the employer?
- ☐ Are work areas evaluated by the employer?

Security Equipment

- ☐ Is there security equipment installed and in good operating condition? If yes does it contain the following equipment:
 - ☐ Access control?
 - ☐ Door-opening devices?
 - ☐ Intrusion detection?
 - ☐ Motion detection?
 - ☐ Sound detection?
 - ☐ Equipment movement detection?
 - ☐ Panic buttons?
 - ☐ Closed circuit television, monitors and switcher?
 - ☐ Video camera recorder?
 - ☐ Stationary metal detectors?
 - ☐ Adequate lighting interior?
 - ☐ Adequate lighting exterior?
 - ☐ Adequate lighting in parking lots/areas?
 - ☐ Mirrors to see around corners and in blind spots?
 - ☐ Landscaping that provides an unobstructed view of the exterior work-place?

- ☐ Limited posting of signs in windows?
- ☐ Employee “safe areas”?
- ☐ Other: _____

Structural Modifications

- ☐ Does the workplace have structural modifications that enhance security? Such as:
 - ☐ Fencing?
 - ☐ Gates and barriers?
 - ☐ Window coatings (such as security film, wire glass, bullet proofing, etc.)?
 - ☐ Emergency intercoms?
 - ☐ Other: _____

Security Guards

- ☐ Does the workplace have security guards? Are they:
 - ☐ Knowledgeable of the company security plan?
 - ☐ Stationed at the entrance?
 - ☐ Patrolling the building?
 - ☐ Provided with communications devices, such as radios?
 - ☐ Well trained?
 - ☐ Professional in appearance and demeanor?

Work Practice Controls and Procedures

- ☐ Are there work practice controls and procedures? Such as:
 - ☐ Reception area available?
 - ☐ Visitors/clients sign in/out?
 - ☐ Barriers to separate clients from work area?
 - ☐ One entrance used?
 - ☐ Separate interview area(s)?
 - ☐ Identification badges used?
 - ☐ Visitor/client badges used?
 - ☐ Emergency numbers posted by phones?
 - ☐ Internal procedures for conflict (problem) situations?
 - ☐ Human resources procedures for hiring/termination?
 - ☐ Limited/designated areas for spouse/family visits?
 - ☐ Other: _____

Off-Premise Procedures

- ☐ Are there off-premises work practices controls and procedures for employees who work away from a fixed workplace? Such as:
 - ☐ Training to avoid hazardous situations?
 - ☐ Briefings about areas where they will work?

- ☐ Reviews of past incidents by type and area?
- ☐ Directions and routes for day's schedule?
- ☐ Previews of client/case histories?
- ☐ Itineraries with contact information?
- ☐ Periodic check-in procedures?
- ☐ After-hours contact procedures?
- ☐ Partnering arrangements imposed, if necessary?
- ☐ Other: _____

Training

- ☐ Is training conducted? Does it include:
 - ☐ New hires prior to initial assignment?
 - ☐ Annual (at least) updates?
 - ☐ Security plan?
 - ☐ Workplace controls and procedures?
 - ☐ Handling violent people?
 - ☐ After-incident follow-up procedures?
 - ☐ Hazards unique to job tasks?
 - ☐ Written training records?
 - ☐ Other: _____

Incident Reporting

- ☐ Are incidents reported in written form and evaluated?
- ☐ Are floor plans posted, showing exits, entrances, and locations of security equipment?
- ☐ Do employees feel safe?
- ☐ Do you have any other security measures in place and operating?

Figure 23-6. Office building security checklist.

Office building security can become very complex and the use of state-of-the-art equipment can be very expensive. But failure to act can be viewed as negligence and thus could result in very costly lawsuits. A proactive approach is superior to sticking your head in the sand.

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CHAPTER 24

PROTECTING THE OFFICE BUILDING FROM NBCs



How do you protect an office building like this from terrorists using NBC weapons?

It cannot be assumed that all acts of terrorism can be prevented. Thus, owners of office buildings must make some preparation for such events so that damage will be minimal and recovery from any such disaster will be rapid. The September 11, 2001, terrorist attack on the World Trade Center in New York and the Pentagon in Washington, D.C. have heightened the concern that terrorists may try to use nuclear, biological and chemical weapons (NBCs) as their weapons of choice.

In a nuclear terrorist event the hazards are thermal radiation, blast, shock effect, and nuclear contamination. The primary protective measure is to distance oneself as far from the blast as possible. Both distance and shielding are protections from the gamma rays and beta particles from the initial event. The residual radiation, commonly called fallout, consists of particles dangerous to inhale (alpha particles) or to the skin (beta particles). Radiation can contaminate open water and food sources which should not be consumed until cleared by those trained in radiation detection and hygiene.

There are many different types of possible biological agents that can cause disease, such as small pox, anthrax, plague, tularemia, and hemorrhagic fever. These are some of the agents that are viewed to be the most likely to be used in such attacks. Biological agents for possible use by terrorists cause illnesses and infections that can be inhaled, swallowed, or accidentally injected when contaminated materials are contacted.

Toxins that come from living organisms mainly bacteria, fungi, algae, and other plants, are difficult to produce in large quantities and are sensitive to light and heat, which makes them difficult to use as weapons. But it is still possible to use them. The most known is botulism toxin, usually recognized as a powerful food poisoning.

Most chemical agents used by terrorists are usually in the form of solids or liquids. The reason for this is that solids and liquids can be dispersed over long distances whereas gases dissipate rather quickly after their initial effects and tend not to have a lingering effect. The chemical agents can harm the respiratory and nervous systems and cause burns to the skin. The type of chemicals used as weapons are varied in potency and effects.

This is just a quick summary of nuclear, biological, and chemical (NBCs) that might be used in a terrorist attack and their nature and effects. More detail on this type of terrorist weapon will be provided further in this chapter.

SUGGESTED ANTI-TERRORISM SECURITY MEASURES

When discussing NBC use as weapons against an office building, it is usually in conjunction with a terrorist style activity. Some precautions can be undertaken to help preclude the ability of a terrorist to easily access an office building or to protect vulnerable areas near, around, or in the building. Some small or low cost actions that can be taken are as follows:

- Maintain situational awareness of world events and ongoing threats.
- Ensure all levels of personnel are notified via briefings, e-mail, voice mail and signage of any changes in threat conditions and protective measures. Encourage personnel to be alert and immediately report any situation that may constitute a threat or suspicious activity.
- Post emergency telephone numbers for police, fire, and rescue. Encourage personnel to memorize important numbers.
- Know the location of the closest police stations, hospitals, schools, etc. Encourage personnel to avoid routines, vary times and routes, pre-plan, and keep a low profile, especially during periods of high threat.
- Encourage personnel to take notice and report suspicious packages, devices, unattended briefcases, or other unusual materials immediately; inform them not to handle or attempt to remove any such object.
- Take any threatening or malicious telephone call, facsimile, or bomb threat seriously. If such a call is received, obtain and record as much information as possible to assist in identification of the caller. Record the time of the call, the exact words, any distinguishing features of the caller, and any background noise. Develop bomb-threat information forms to assist, if not already in place. When an operator or other employee receives a bomb threat, there should be a written protocol to complete.

- Encourage personnel to keep their family members and supervisors apprised of their whereabouts.
- Encourage personnel to know emergency exits and stairwells.
- Increase the number of visible security personnel wherever possible.
- Rearrange exterior vehicle barriers, traffic cones, and roadblocks to alter traffic patterns near facilities and cover by alert security forces.
- Institute/increase vehicle, foot and roving security patrols varying in size, timing and routes.
- Implement random security guard shift changes.
- Arrange for law enforcement vehicles to be parked randomly near entrances and exits,
- Review current contingency plans and if not already in place, develop and implement procedures for receiving and acting on threat information, alert notification procedures, terrorist incident response procedures, evacuation procedures, bomb threat procedures, hostage and barricade procedures, chemical, biological, and nuclear (NBC) procedures, consequence and crisis management procedures, accountability procedures, and media procedures.
- When the aforementioned plans and procedures have been implemented, conduct internal training exercises and invite local emergency responders (fire, rescue, medical and bomb squads) to participate in joint exercises. Coordinate and establish partnerships with local authorities to develop intelligence and information-sharing relationships.
- Place personnel on standby for contingency planning.
- Limit the number of access points and strictly enforce access control procedures.
- Implement stringent identification procedures to include conducting 100% “hands on” checks of security badges for all personnel, if badges are required.
- Remind personnel to display badges properly, if applicable, and enforce visibility.
- Require two forms of photo identification for all visitors. Escort all visitors entering and departing.
- X-ray all packages, if possible, prior to entry, and inspect all handbags, and briefcases.
- Validate vendor lists of all routine emergency deliveries and repair services.
- Approach all illegally parked vehicles in and around facilities, question drivers and direct them to move immediately, if owner cannot be identified, have vehicle towed by law enforcement.

Other actions that can be undertaken may result in some cost. But, the cost may be well worth the investment depending upon the risk to the office building and its occupants. Some of the actions that can be undertaken are:

- Consider installing telephone caller I.D., record phone calls, if necessary.
- Increase perimeter lighting.
- Deploy visible security cameras and motion sensors.
- Remove vegetation in and around perimeters and maintain regularly.
- Institute a robust vehicle inspection program to include checking the undercarriage of vehicles, under the hood, and in the trunk. Provide vehicle inspection training to security personnel.
- Deploy explosive detection devices and explosive detection canine teams. Conduct vulnerability studies focusing on physical security, structural engineering, infrastructure engineering, power, water, and air infiltration, if feasible.
- Initiate a system to enhance mail and package screening procedures (both announced and unannounced).
- Install special locking devices on manhole covers in and around facilities.
- Implement a counter-surveillance detection program.

TERRORIST WEAPONS

Every time you pick up a newspaper or magazine, the headlines warn us about the potential for another terrorist attack. Turn on the television and you hear about the most recent bombing. On a daily basis we are confronted with the potential for another major terrorist attack, this time maybe using nuclear biological agents or chemicals. People like to say that on September 11, 2001, the world we live in changed mainly because the acts of terrorism came to our homeland. In some respects it did; however, if you look back through history, acts of biological and chemical terrorism have been happening for centuries. Seldom had they been used against the modern office building and its occupants but that possibility is more of a reality today. An understanding of these types of weapons which terrorist could use is educational and somewhat reassuring that their use can be mitigated by understanding and planning.

Nuclear Weapons

While biological and chemical terrorism may be the most prevalent risk facing the world today, some people think that there is potential for the use of nuclear materials by terrorists. Possible events could include introducing radioactive material into the food or water supply, using explosives to scatter radioactive material (dirty bomb), bombing or destroying a nuclear reactor or exploding a small nuclear device.

On a daily basis, humans are exposed to radiation, which can be defined as energy that can travel through the air. Some radiation is naturally occurring. Traces of naturally occurring radiation are present in food and waters. Other sources of man-made radiation are X-ray machines, televisions, microwaves and nuclear reactors that generate electricity. Nuclear reactors can release errant radiation due to acci-

dents, but this is fairly remote. Much has been made in the news and in the press about “dirty bombs.” This is not a nuclear bomb like the ones dropped in World War II. A dirty bomb uses conventional explosives to disperse radiation into the air. This type of bomb would tend to contaminate areas with low levels of radiation and cause panic. No one wants to be exposed to radiation. Much can be done to mitigate the damage by understanding the use and outcomes of a dirty bomb.

The biggest concern in the use of a dirty bomb is not the damage from the explosion but the radioactive contamination left behind. The dirty bomb combines conventional explosives with radioactive material that would be spread around the area of the explosion. The dirty bomb would have both a physical and psychological effect on the people in the area of the blast.

Contamination of the food or water supply with radioactive material would be difficult for someone to accomplish. While it may cause fear and panic, the adverse health effects would probably be minimal. The explosive blast would cause injury to people and damage to surrounding buildings. As far as radiation exposure, it is likely that a dirty bomb would contain low-level radioactive material that would cause little harm. Depending upon the air intake of the building, its structural integrity, and your planning, an office building may experience no effects from a “dirty bomb.”

An attack on a nuclear facility resulting in the meltdown of a reactor or exploding a nuclear device could cause contamination to many people in the surrounding area. However, the increase in security at nuclear sites and the difficulty a terrorist group would have in obtaining a nuclear device (bomb) seem to make this a relatively small risk. Further information on nuclear exposure levels, doses and effect can be found in Appendix G.

Biological Weapons

Biological agents are not difficult to cultivate. Someone with a limited knowledge of microbiology can produce these agents. These biological agents are classified into three main categories: bacterial agents, viral agents and biological toxins. Common bacterial agents that may be used in a terrorist attack include anthrax, pneumonic/bubonic plague, tularemia, Q fever and salmonella. These microorganisms can be grown in artificial media and can live for long periods of time without infecting tissue.

Bacterial Agents

Anthrax was first prepared as a weapon by the United States in the 1950s and its production continued until the biological weapons program was terminated. Anthrax is easily grown and can be kept indefinitely in spore form. It can be disseminated as a dust to be inhaled or used to contaminate the environment or water supply, causing the disease to be spread days or weeks later. Once the anthrax bacteria is inhaled or ingested, the bacteria incubates for one to six days. The symptoms of anthrax poisoning include chest pain, cough, fatigue and fever. More serious symptoms develop as the infection becomes worse and include shortness of breath, diaphoresis and cyanosis leading to shock and death.

Pneumonic and bubonic plague are caused by the same bacteria but have different symptoms. The bacteria is normally spread by rodents and fleas; however, the organism could be introduced into the environment through aerolized bacteria.

Bubonic plague is characterized by swollen lymph nodes and fever. The affected lymph nodes are generally in the groin area since infected fleas often bite the leg area. The incubation period for bubonic plague is between two and ten days.

The incubation for pneumonic plague's onset is much faster, two or three days. The infection is spread from person to person by the infected host's coughing or sneezing. Symptoms of pneumonic plague include fever, chills, coughing, bloody sputum, dyspnea, and cyanosis.

Tularemia was also prepared as a biological weapon by the United States in the 1950s. Blood and body fluids of an infected person or animal or the bite of an infected deer fly, tick or mosquito can transmit the disease. Inhalation of aerolized bacteria would initiate a typhoidal tularemia infection in two to ten days. Tularemia persists for weeks in water, soil, or animal hides. Symptoms of an infection include local ulcerations, swollen lymph nodes, fever, chills and headache. Even if left untreated, the death rate from this infection is about five percent.

Q fever (query fever) is another weapon previously kept by the United States biological programs. It occurs naturally as an infection in sheep, cattle and goats and is disseminated through inhalation of infected aerolized material. Symptoms begin to appear ten to twenty days after exposure and can last two days to two weeks. Q fever symptoms include fever, headache, fatigue and occasionally pneumonia, but it is usually not fatal. However, the ease of spreading of this agent could cause panic in the general population.

The last bacterial agent, salmonella, causes one of the most common types of food poisoning. This infection occurs naturally by ingesting food contaminated with infected feces. It would be rather simple for terrorists to use this agent. Once a food source is identified as contaminated, it could be mixed with uncontaminated food and distributed to victims. After ingestion of contaminated food, symptoms begin within eight to forty hours. Symptoms include fever, headache, abdominal pain and watery diarrhea. Infected victims can spread the infection if caretakers do not protect themselves from body fluids.

Viral Agents

There are two viral agents that are considered to be prime substances to be used in a biological attack: viral hemorrhagic fevers (VHF) and smallpox. Viral hemorrhagic fevers are a group of viruses that cause uncontrollable external and internal bleeding. Some of the more widely known VHFs are ebola virus, hantavirus, yellow fever, and dengue hemorrhagic fever. Depending on the extent of the infection and the virus responsible, the mortality rate can be as high as 90%. As has been seen recently in some third world countries, ebola is very contagious, has a rapid onset of symptoms and a very high mortality rate. While it is felt that terrorists would most likely use only threats and hoaxes about these viruses to cause panic, it is possible that they could obtain the viruses and use them as weapons.

Smallpox was virtually eradicated by 1980 through vaccinations and quarantine activities. Since then, there have been no further outbreaks reported worldwide. There are, however, two known supplies of the smallpox virus remaining, one at the Center for Disease Control (CDC) in Atlanta and the other in the Soviet Union. In the past, other countries have experimented with the smallpox virus as a biological weapon so it is possible that there are other sources of the virus out there. This virus is easily produced and its aerolized toxicity makes it an ideal weapon. If terrorists were able to obtain a small amount of the virus, they could quickly cultivate enough

of the virus to infect thousands of people. After exposure to the virus, there is an incubation period of seven to seventeen days during which a person is not contagious. The first symptoms may include fever, malaise, head and body aches. After these initial symptoms, a rash develops, usually as small red spots on the tongue and in the mouth. These sores break open and spread large amounts of the virus into the mouth and throat. It is at this time that the person is most contagious. About the same time, a rash appears on the skin, starting on the face and spreading to the arms and legs, then hands and feet. This usually occurs within 24 hours. By the third day, the rash becomes raised bumps and on the fourth day the bumps fill with a thick fluid and often have a depression in the center that looks like a navel. This is a major distinguishing characteristic of smallpox. At this point the fever spikes again and stays high until scabs form over the bumps. These bumps become pustules and eventually form scabs (usually about two weeks after the rash first began). The scabs begin to fall off, leaving marks on the skin that eventually become pitted scars. It takes as long as three weeks after the rash first appears for all the scabs to fall off. The person remains contagious until all scabs have fallen off.

Biological Toxins

There are two biological toxins that could easily be used in a terror attack: botulinum toxin and ricin. Botulism is serious and occasionally a fatal disease caused by a toxin produced from an anaerobic bacterium. The bacteria are found in poorly handled food and account for many cases of food poisoning (botulism). This toxin could be easily produced and spread over a targeted area as an aerolized particle. Botulinum toxins are believed to be the most poisonous substances discovered. They are 15,000 times more toxic than VX, the most toxic of known nerve agents. The toxin affects the ability to transmit nerve impulses to the skeletal muscles, which can lead to, among other things, respiratory failure. There are antitoxins available but those have their own inherent risks such as anaphylaxis.

Ricin is a poison made from the waste from processing castor beans. It can be in the form of a powder, a mist or pellet. Exposure can occur through inhalation or ingestion. Ricin works by getting inside the cells in the body and preventing those cells from producing the proteins they need. Without the proteins, the cells die and eventually the whole body can shut down and die. There is no antidote for ricin poisoning. More information can be found regarding biological agents, their signs, and symptoms in Appendix G.

Chemical Weapons

When thinking about various chemical agents that might be used in a chemical attack, the first ones that come to mind are sarin nerve gas, sulfur mustard and VX. Emergency personnel must also recognize the potential for exposure to more common chemicals such as chlorine or anhydrous ammonia.

Sarin is a human-made chemical warfare agent classified as a nerve agent. It is a clear, colorless, tasteless liquid that has no odor in its pure form. People can be exposed through skin contact, eye contact or inhalation if it is released into the air. Sarin mixes easily with water so it could be used to contaminate a public water supply. Symptoms of exposure to sarin can appear within a few seconds or up to 18 hours depending on the extent of the exposure. Sarin causes the glands and muscles of the body to be constantly stimulated, eventually tiring victims to the point where

they are no longer able to sustain respirations. Sarin is a volatile nerve agent, which quickly evaporates and spreads into the environment. Because it evaporates so quickly, it presents an immediate but short-lived threat.

VX is another man-made nerve agent. It is an oily, tasteless, odorless, amber colored liquid that is very slow to evaporate. It is primarily a liquid exposure hazard although it can give off vapor if heated to very high temperatures. VX is the most potent of all nerve agents and causes the same constant stimulation of glands and muscles as sarin. Because it is slow to evaporate, it remains on objects for days in average weather and for months in cold conditions.

Sulfur mustard is another man-made warfare agent. It is called a blistering agent because it blisters the skin and mucous membranes on contact. It can be a vapor, an oily liquid or a solid. If released into the air, sulfur mustard can be carried long distances by the wind, exposing people through skin contact or inhalation. It lasts 1-2 days in the environment under average weather conditions and from weeks to months in cold conditions. Liquid sulfur mustard can cause 2nd and 3rd degree burns and scarring. Breathing the vapors can damage the respiratory tract.

If a person is exposed to any of these chemical agents, the first thing to do is to remove the person from the affected area. Any clothing contaminated with the agent should be removed and disposed of. The person needs to be decontaminated as quickly as possible and should receive medical care immediately. More information on the types of chemical weapons and their effects can be found in Appendix G.

PROTECTING THE OFFICE BUILDING FROM NBCs

There are no foolproof ways to prevent the effects of a terrorist attack on your office building. Also, there is no way to predict which office building might be attacked. But, your knowledge of the business or businesses in your office building will help you determine the risk. If you are an easy target and have done nothing to deter an NBC attack, then you are being negligent since it is known that such an attack is a possibility.

Everything in this section assumes that the attack on your building will use airborne materials that can be injected into the office building HVAC system and dispersed throughout the building. Understanding the systems in your building and how they operate will allow you to incorporate some of the recommendations in this section, thus better protecting your building and its workforce from an NBC attack.

No building can be fully protected from a determined individual who is intent on releasing a NBC agent. The recommendations in this section will not preclude injuries or fatalities in the event of a NBC release. However, facility owners and managers can transform their buildings into less attractive targets by increasing the difficulty of introducing a NBC agent, by increasing the ability to detect terrorists before they carry out an intended release, and by incorporating plans and procedures to mitigate the effects of a NBC release.

These recommendations focus on airborne releases of NBC agents in quantities capable of being easily transported by a few individuals. Protection from other types of attacks, such as explosions, building collapses, and water supply contamination requires much different measures and are not addressed in this section.

Each office building is inherently different and will not be able to incorporate all of the recommendations in this section. The decisions concerning which pro-

tective measures should be implemented for any building should be based on several factors, including the perceived risk associated with the building and its tenants, engineering and architectural feasibility, and cost. The first step would be to make an assessment of your office building and how its systems operate. Some types of general security, such as denying access to the building, could be instituted before the survey is completed. But, it is wise to hire a consultant who can make a complete assessment of your building vulnerability and feasibility for making the needed changes based upon risk and cost. A checklist follows that should guide you in completing an assessment to better protect your building from an NBC attack (see Figure 24-1). This walk-through assessment is best done with an HVAC expert.

You now have accurate information upon which to base the decisions regarding making your office building less attractive to terrorists.

As you can see, the main concerns are the airflow patterns and dynamics in buildings, specifically in the building's heating, ventilating, and air-conditioning (HVAC) systems. These systems can become an entry point and a distribution system for hazardous contaminants, particularly NBC agents. Building owners need reliable information about how they can (1) modify their buildings to decrease the likelihood or effects of an NBC incident and (2) respond quickly and appropriately should an NBC incident occur. Comprehensive guidance is needed in several areas, including:

- How to modify existing buildings for better air protection and security.
- How to design new buildings to be more secure.
- What plans building managers should prepare in advance to help them make effective decisions in the midst of an NBC incident.

The recommendations made in this section can be divided into four general categories: (1) things not to do; (2) physical security; (3) ventilation and filtration; and (4) maintenance, administration, and training. Some of these items, such as securing mechanical rooms, may be started prior to your completing your walk-through as part of your general security effort. **Note: Some items within each of the four categories are more critical than others so those will be bolded to call your attention to them.**

Things Not to Do

More than anything else, building owners and managers should ensure that any actions they take do not have a detrimental effect on the building systems (HVAC, fire protection, life safety, etc.) or the building occupants under normal building operation. Some efforts to protect the building from an NBC attack could have adverse effects on the building's indoor environmental quality. Building owners and managers should understand how the building systems operate and assess the impact of security measures on those systems.

- **Do not permanently seal outdoor air intakes.** Buildings require a steady supply of outdoor air appropriate to their occupancy and function. Closing off the outdoor air supply vents will adversely affect the building occupants and likely result in a decrease in indoor environmental quality and an increase in indoor environmental quality complaints.
- **Do not modify the HVAC system without first understanding the effects on the building's systems or the occupants.** If there is uncer-

OFFICE BUILDING CHECKLIST FOR PREVENTION OF AN NBC ATTACK

- ☐ Yes ☐ No Is the mechanical condition of the equipment good?
- ☐ Yes ☐ No Is there an adequate filtration system in place?
 - ☐ Yes ☐ No Does it have any deficiencies?
- ☐ Yes ☐ No Is all equipment appropriately connected and controlled?
 - ☐ Yes ☐ No Are equipment access doors and panels in place and appropriately sealed?
- ☐ Yes ☐ No Are all dampers (outdoor air, return air, bypass, fire and smoke) functioning?
 - ☐ Yes ☐ No Do all of them seal well when closed?
- ☐ Yes ☐ No How does the HVAC system respond to manual fire alarm, fire detection, or fire-suppression device activation?
- ☐ Yes ☐ No Are all supply and return ducts completely connected to their grilles and registers?
- ☐ Yes ☐ No Are the variable air volume (VAV) boxes functioning?
- ☐ Yes ☐ No How is the HVAC system controlled?
 - ☐ Yes ☐ No Is its speed of response adequate?
- ☐ Yes ☐ No Is the building zoned properly?
 - ☐ Yes ☐ No Are the air handlers for each zone easily located?
 - ☐ Yes ☐ No Is the system designed for smoke control?
- ☐ Yes ☐ No Is the air flow through the building known?
 - ☐ Yes ☐ No Are the pressure relationships between zones known?
 - ☐ Yes ☐ No Are building entryways positively or negatively pressurized?
 - ☐ Yes ☐ No Is the building connected to other buildings by tunnels or passageways?
- ☐ Yes ☐ No Do utility chases and penetrations, elevator shafts, and fire stairs have significant airflow pathways?
- ☐ Yes ☐ No Is there obvious air infiltration?
 - ☐ Yes ☐ No Is it localized?
- ☐ Yes ☐ No Does the system provide adequate ventilation given the building's current occupancy and functions?
- ☐ Yes ☐ No Is the location of the outdoor air louvers known?
 - ☐ Yes ☐ No Are they easily observable?
- ☐ Yes ☐ No Are the air louvers or other mechanical equipment accessible to the public?
- ☐ Yes ☐ No Do adjacent structures or landscaping allow access to the building roof?

Figure 24-1. Office building checklist for prevention of NBC attacks.

tainty about the effects of a proposed modification, a qualified professional should be consulted.

- **Do not interfere with fire protection and life safety systems.** They should not be altered without guidance from a professional specifically qualified in fire protection and life safety systems.

Physical Security

Preventing terrorist access to a targeted facility requires physical security of entry, storage, roof, and mechanical areas, as well as securing access to the outdoor air intakes of the building HVAC system. The physical security needs of each building should be assessed, as the threat of a NBC attack will vary considerably from building to building. For example, the threat to a large corporate headquarters may be considered greater than the threat to a small retail establishment. Some physical security measures, such as locking doors to mechanical rooms, are low cost and will not inconvenience the users of the building. These types of measures can be implemented in most buildings. Other physical security measures, such as increased security personnel or package x-ray equipment, are more costly or may inconvenience users substantially. These measures should be implemented when merited after consideration of the threat and consequences of a terrorist attack. Some physical security recommendations follow:

- **Prevent access to outdoor air intakes.** Outdoor air enters the building through these intakes and is distributed throughout the building by the HVAC system. Introducing NBC agents into the outdoor air intakes allows a terrorist to use the HVAC system as a means of dispersing the agent throughout a building. Publicly accessible outdoor air intakes located at or below ground level are at most risk—due partly to their accessibility. Securing the outdoor air intakes is a critical line of defense in limiting an external CBR attack on a building.

Relocate outdoor air intake vents. Relocating accessible air intakes to a publicly inaccessible location is preferable. Ideally, the intake should be located on a secure roof or high sidewall (see Figure 24-2).

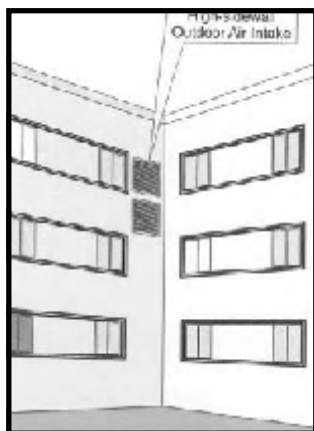


Figure 24-2. Relocating outdoor air intake vents. (Courtesy of the National Institute for Occupational Safety and Health.)

Extend outdoor air intakes. If relocation of outdoor air intakes is not feasible, an extension height of 12 feet (3.7 m) will place the intake out of reach of individuals without some assistance. The higher it is the better (see Figure 24-3).

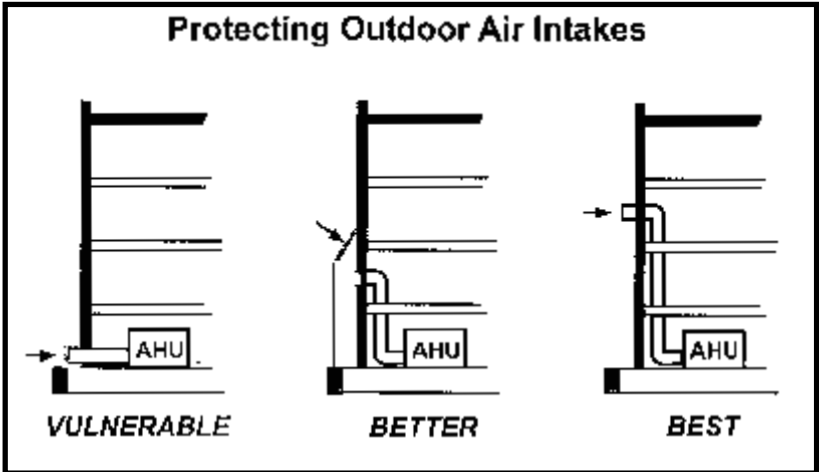


Figure 24-3. Extend outdoor air intakes. (Courtesy of the National Institute for Occupational Safety and Health.)

Also, the entrance to the intake should be covered with a sloped metal mesh to reduce the threat of objects being tossed into the intake. A minimum slope of 45° is generally adequate (see Figures 24-4 and 24-5).

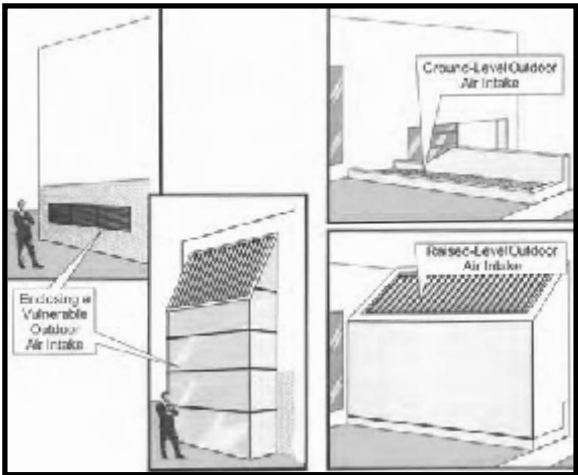


Figure 24-4. Covering air intakes. (Courtesy of the National Institute for Occupational Safety and Health.)

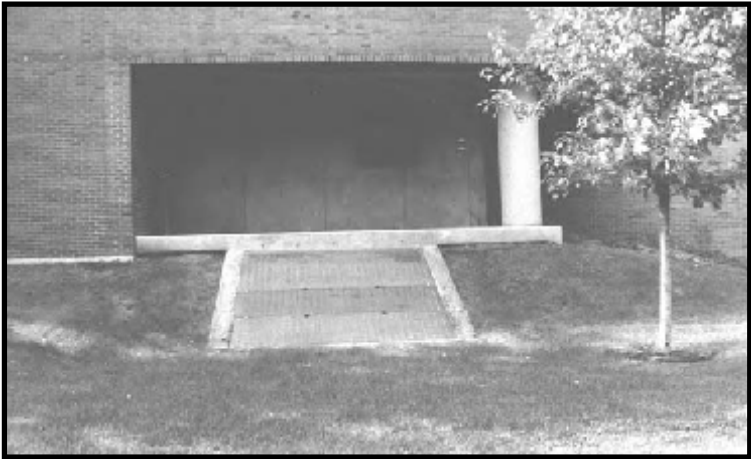


Figure 24-5. A poorly protected intake air area for an office building.

Establish a security zone around outdoor air intakes. Physically inaccessible outdoor air intakes are the preferred protection strategy. When outdoor air intakes are publicly accessible and relocation or physical extensions are not viable options, perimeter barriers that prevent public access to outdoor air intake areas may be an effective alternative. Iron fencing or similar see-through barrier that will not obscure visual detection of terrorist activities or a deposited CBR source is preferred. The restricted area should also include an open buffer zone between the public areas and the intake louvers. Thus, individuals attempting to enter these protected areas will be more conspicuous to security personnel and the public. Monitoring the buffer zone by physical security, closed-circuit television (CCTV), security lighting, or intrusion detection sensors will enhance this protective approach (see Figure 24-6).

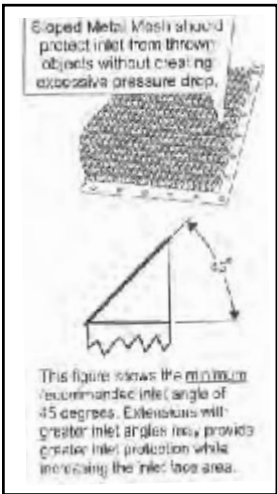


Figure 24-6. Constructing a security zone around outdoor air intakes. (Courtesy of the National Institute for Occupational Safety and Health.)

- **Prevent public access to mechanical areas.** Mechanical areas may exist at one or more locations within a building. These areas provide access to centralized mechanical systems (HVAC, elevator, water, etc.), including filters, air handling units, and exhaust systems. Such equipment is susceptible to tampering and may subsequently be used in an NBC attack. Access to mechanical areas should be strictly controlled by keyed locks, keycards, or similar security measures.
- **Prevent public access to building roofs.** Access to a building's roof can allow ingress to the building and access to air intakes and HVAC equipment (e.g., self-contained HVAC units, laboratory or bathroom exhausts) located on the roof. Roofs with HVAC equipment should be treated like mechanical areas. Fencing or other barriers should restrict access from adjacent roofs. Fire and life safety egress should be carefully reviewed when restricting roof access.
- Implementing security measures, such as guards, alarms, and cameras to protect vulnerable area. Security personnel, barriers that deter loitering, intrusion detection sensors, and observation cameras can further increase protection by quickly alerting personnel to security breaches near the outdoor air intakes or other vulnerable locations.
- Isolate lobbies, mailrooms, loading docks, and storage areas. These areas should be physically isolated from the rest of the building. These are areas where bulk quantities of NBC agents are likely to enter a building. Building doors, including vestibule and loading dock doors, should remain closed when not in use. To prevent widespread dispersion of a contaminant released within lobbies, mailrooms, and loading docks, their HVAC systems should be isolated and the areas maintained at a negative pressure relative to the rest of the building, but at positive pressure relative to the outdoors.

Building access from lobby areas should be limited by security checks of individuals and packages prior to their entry into secure areas. Lobby isolation is particularly critical in buildings where the main lobbies are open to the public. Similar checks of incoming mail should also occur before its conveyance into the secure building areas. Side entry doors that circumvent established security checkpoints should be strictly controlled.

- **Secure return air grilles.** Similar to the outdoor-air intake, HVAC return-air grilles that are publicly accessible and not easily observed by security may be vulnerable to targeting for NBC contaminants. Public access facilities may be the most vulnerable to this type of NBC attack. Some return-air grille protective measures include (1) relocating return-air grilles to inaccessible, yet observable locations, (2) increasing security presence (human or CCTV) near vulnerable return-air grilles, (3) directing public access away from return-air grilles, and (4) removing furniture and visual obstructions from areas near return air grilles.
- **Restrict access to building operation systems by outside personnel.** To deter tampering by outside maintenance personnel, a building staff member should escort these individuals throughout their service visit and

should visually inspect their work before final acceptance of the service. Alternatively, building owners and managers can ensure the reliability of pre-screened service personnel from a trusted contractor.

- Restrict access to building information. Information on building operations—including mechanical, electrical, vertical transport, fire and life safety, security system plans and schematics, and emergency operations procedures—should be strictly controlled. Such information should be released to authorized personnel only, preferably by the development of an access list and controlled copy numbering.
- General building physical security upgrades. In addition to the security measures for HVAC and other building operations described earlier, physical security upgrades can enhance the overall security of a building.

VENTILATION AND FILTRATION

HVAC systems and their components should be evaluated with respect as to how they impact vulnerability to the introduction of NBC agents. Relevant issues include the HVAC system controls, the ability of the HVAC system to purge the building, the efficiency of installed filters, the capacity of the system relative to potential filter upgrades, and the significance of uncontrolled leakage into the building.

- **Evaluate HVAC control options.** Many central HVAC systems have energy management and control systems that can regulate airflow and pressures within a building on an emergency response basis. Some modern fire alarm systems may also provide useful capabilities during NBC events. In some cases, the best response option (given sufficient warning) might be to shut off the building's HVAC and exhaust systems, thus avoiding the introduction of an NBC agent from outside. In other cases, interior pressure and airflow control may prevent the spread of a CBR agent released in the building and/or ensure the safety of egress pathways. The decision to install emergency HVAC control options should be made in consultation with a qualified HVAC professional that understands the ramifications of various HVAC operating modes on building operation and safety systems.
- **Assess filtration.** Increasing filter efficiency is one of the few measures that can be implemented in advance to reduce the consequences of both an interior and exterior release of a particulate CBR agent. However, the decision to increase efficiency should be made cautiously, with a careful understanding of the protective limitations resulting from the upgrade. The filtration needs of a building should be assessed with a view to implementing the highest filtration efficiency that is compatible with the installed HVAC system and its required operating parameters. In general, increased filter efficiency will provide benefits to the indoor environmental quality of the building. However, the increased protection from NBC aerosols will occur only if the filtration efficiency increase applies to the particle size range and physical state of the NBC contaminant. It is important to note that particulate air filters are used for biological and

radiological particles and are not effective for gases and vapors typical of chemical attacks. These types of compounds require adsorbent filters (i.e., activated carbon or other sorbent-type media) and result in substantial initial and recurring costs.

- *Ducted and non-ducted return air systems.* Ducted returns offer limited access points to introduce an NBC agent. The return vents can be placed in conspicuous locations, reducing the risk of an agents being secretly introduced into the return system. Non-ducted return air systems commonly use hallways or spaces above dropped ceilings as a return-air path or plenum. NBC agents introduced at any location above the dropped ceiling in a ceiling plenum return system will most likely migrate back to the HVAC unit and, without highly efficient filtration for the particular agent, redistribute to occupied areas. Buildings should be designed to minimize mixing between air-handling zones, which can be partially accomplished by limiting shared returns.
- *Low-leakage, fast-acting dampers.* Rapid response, such as shutting down an HVAC system, may also involve closing various dampers, especially those controlling the flow of outdoor air (in the event of an exterior NBC release). When the HVAC system is turned off, the building pressure compared to outdoors may still be negative, drawing outdoor air into the building via many leakage pathways, including the HVAC system. Consideration should be given to installing low leakage dampers to minimize this flow pathway. From a protective standpoint, dampers that respond quickly are preferred over dampers that might take 30 seconds or more to respond.
- *Building air tightness.* Significant quantities of air can enter a building by means of infiltration through unintentional leakage paths in the building envelope. Such leakage is of more concern for an exterior NBC release at some distance from a building, such as a large-scale attack, than for a directed terrorist act. The reduction of air leakage is a matter of tight building construction in combination with building pressurization. While building pressurization may be a valuable NBC-protection strategy in any building, it is much more likely to be effective in a tight building.

MAINTENANCE, ADMINISTRATION AND TRAINING

Maintenance of ventilation systems and training of staff are critical for controlling exposure to airborne contaminants, such as NBC agents.

- **Emergency plans, policies, and procedures.** All buildings should have current emergency plans to address fire, weather, and other types of emergencies. In light of past U.S. experiences with anthrax and similar threats, these plans should be updated to consider NBC attack scenarios and the associated procedures for communicating instructions to building occupants, identifying suitable shelter-in-place areas (if they exist), identifying appropriate use and selection of personal protective equipment (e.g., clothing, gloves, respirators) and directing emergency evacuations. In-

dividuals developing emergency plans and procedures should recognize that there are fundamental differences between chemical, biological, and radiological agents. In general, chemical agents will show a rapid onset of symptoms, while the response to biological and radiological agents will be delayed. Issues such as designated areas and procedures for chemical storage, HVAC control or shutdown, and communication with building occupants and emergency responders should all be addressed. The plans should be as comprehensive as possible, but, as described earlier, include protecting sensitive areas by limiting and controlling access to them. When appropriately designed, these plans, policies, and procedures can have a major impact upon occupant survivability in the event of a CBR release. Staff training, particularly for those with specific responsibilities during an event, is essential and should cover both internal and external events. Holding regularly scheduled practice drills, similar to the common fire drill, allows for plan testing, as well as occupant and key staff rehearsal of the plan, and increases the likelihood for success in an actual event.

- **HVAC maintenance staff training.** Periodic training of HVAC maintenance staff in system operation and maintenance should be conducted. This training should include the procedures to be followed in the event of a suspected NBC agent release. Training should also cover health and safety aspects for maintenance personnel, as well as the potential health consequences to occupants of poorly performing systems. Development of current, accurate HVAC diagrams and HVAC system labeling protocols should be addressed. These documents can be of great value in the event of an NBC release.
- **Preventive maintenance and procedures.** Procedures and preventive maintenance schedules should be implemented for cleaning and maintaining ventilation system components. Replacement filters, parts, and so forth should be obtained from known manufacturers and examined prior to installation. It is important that ventilation systems be maintained and cleaned according to the manufacturer's specifications. To do this requires information on HVAC system performance, flow rates, damper modulation and closure, sensor calibration, filter pressure loss, filter leakage, and filter change-out recommendations. These steps are critical to ensure that protection and mitigation systems, such as particulate nitration, operate as intended.

PERSONAL PROTECTIVE EQUIPMENT

The use of personal protective equipment (PPE) in the event of an NBC weapon attack on your office building is really not very feasible. Most of the needed PPE would be fairly sophisticated and require special training of each worker. You would need special programs for respirators and would need to conduct a hazard assessment regarding what PPE would be necessary. This PPE would need to be maintained even after what would be a rather costly purchase.

Even if all the above were accomplished, workers might not be able to don such equipment in time to mitigate the potential damage to themselves. Many times

even well-trained workers fail to use PPE correctly. Logistically, it is probably best to try to secure and protect the office building from infiltration of NBCs rather than try to make use of PPE in your office building. Since PPE is always the control of last resort, you will be farther ahead looking to engineering controls to protect an office building staff or occupants.

SUMMARY

Reducing a building's vulnerability to an airborne nuclear, biological, or chemical attack requires a comprehensive approach. Decisions concerning which protective measures to implement should be based upon the threat profile and a security assessment of the building and its occupants. While physical security is the first layer of defense, other issues must also be addressed. Preventing possible terrorist access to outdoor air intakes and mechanical rooms and developing NBC-contingent emergency response plans should be addressed as soon as possible. Additional measures can provide further protection. A building security assessment should be done to determine the necessity of additional measures. Some items, such as improved maintenance and HVAC system controls, may also provide payback in operating costs and/or improved building air quality. As new building designs or modifications are considered, designers should consider that practical NBC sensors may soon become available. Building-system design features that are capable of incorporating this rapidly evolving technology will most likely offer a greater level of protection.

While it is not possible to completely eliminate the risk of an NBC terrorist attack, several measures can be taken to reduce the likelihood and consequences of such an attack. Many of the recommendations presented here are ones that can be implemented reasonably quickly and cost effectively. Many are applicable to both new construction and existing buildings, although some may be more feasible than others. Building owners and managers should assess buildings by looking first for those items that are most vulnerable and can be addressed easily. Additional measures should be implemented as feasible. The goals are to make your building an unattractive target for an NBC attack and to maximize occupant protection in the event that such an attack occurs.

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CHAPTER 25

WORKPLACE VIOLENCE



Workplace security should also address the potential for workplace violence. (Courtesy of the National Institute for Occupational Safety and Health.)

In recent years it has become apparent that workplace security is a major emphasis of occupational safety and health. Workers should feel that they can come to work and work their jobs without the threat that they may come to harm in some way from violence during their work period.

Thus, with the escalation of workplace violence in the past two decades violence in the workplace has reared its ugly head as a workplace issue, with homicide being the second leading cause of work-related death in 1998 with 709 (12%) of the 6,026 occupational deaths. Of these deaths only 15 percent were from co-workers, seven percent from acquaintances, and four percent from relatives. The bulk, some 281, were the result of robbery or attempted robbery. Although women account for nearly half the workforce, they suffered 23% of the homicides in 1998. However, homicides were by far the leading manner in which women were fatally injured while working. Overall women account for only seven percent of the work-related fatalities while men account for 93 percent of all work-related deaths and 81 percent of the homicides.

Office workers are usually not as vulnerable to workplace violence as late-night retail stores and taxi drivers, but enough cases have occurred that it becomes good business practice for owners/employers in office buildings to address this issue. The first step would be for the owner or employer to set the ground rules and expectations in a policy statement.

WORKPLACE VIOLENCE POLICY STATEMENT

The owner/employer must take a stand in writing. This is the intent of the policy statement. This statement is a commitment to design work practices and procedures with a view to reducing the likelihood or severity of workplace violence. Employees should be required to acknowledge receipt of the written policy regarding employee discipline and actions to be taken when harassment, threats, abuse or other inappropriate behavior occurs. For workplace violence it has been recommended by many experts that zero tolerance should be standard. All complaints should be documented and investigated, with constant even-handed discipline meted out. Lines of communication should be clear and available to all employees to report actual or threatened violent conduct. A sample policy statement can be found in Figure 25-1.

BUILDING A COMPLETE PROGRAM

In order to protect workers from workplace violence, you need more than just a policy. In an effective workplace violence program there must be attention given to other components such as training, reporting, and personnel hiring practices. You cannot overlook the interrelatedness between security and workplace violence as could be seen in Chapter 23. A sample workplace violence security program can be found in Appendix I.

Personnel Practices

It is imperative that a background check be done on individuals whom you are about to hire. This should include drug testing. This will allow you to screen out individuals who may have patterns of violent behavior.

Training

It is not enough to train managers and supervisors regarding workplace violence. You should train all employees and especially all new hires. They should be given your policy and it should be explained to them. Employees should know your reporting practices and how to report an incident. They should know what types of behaviors may be indicators that can signal the risk of potential violent episodes. Some of these are as follows:

- Sudden and persistent complaining about being treated unfairly.
- Blaming of others for personal problems.
- Sudden change in behavior, deterioration in job performance.

**MODEL POLICY FOR WORKPLACE
THREATS AND VIOLENCE**

Nothing is more important to (Company Name) than the safety and security of its employees. Threats, threatening behavior, or acts of violence against employees, visitors, guests, or other individuals by anyone on (Company Name) property will not be tolerated. Violations of this policy will lead to disciplinary action that may include dismissal, arrests, and prosecution.

Any person who makes substantial threats, exhibits threatening behavior, or engages in violent acts on (Company Name) property shall be removed from the premises as quickly as safety permits and shall remain off (Company Name) premises pending the outcome of an investigation. (Company Name) will initiate an appropriate response. This response may include, but is not limited to, suspension and/or termination of any business relationship, reassignment of job duties, suspension or termination of employment, and/or criminal prosecution of the person or persons involved.

No existing (Company Name) policy, practice, or procedure should be interpreted to prohibit decisions designed to prevent a threat from being carried out, a violent act from occurring or a life-threatening situation from developing.

All (Company Name) personnel are responsible for notifying the management representative designated below of any threats that they have witnessed, received, or have been told that another person has witnessed or received. Even without an actual threat, personnel should also report any behavior they have witnessed that they regard as threatening or violent, when that behavior is job related or might be carried out on a company controlled site, or is connected to company employment. Employees are responsible for making this report regardless of the relationship between the individual who initiated the threat or threatening behavior and the person or persons who were threatened or were the focus of the threatening behavior. If the designated management representative is not available, personnel should report the threat to their supervisor or another member of management.

All individuals who apply for or obtain a protective or restraining order that lists company locations as being a protected area must provide to the designated management representative a copy of the petition and declarations used to seek the order and a copy of any temporary protective or restraining order that recognizes and respects the privacy of the reporting employee(s).

The designated management representative is:

Name: _____

Title: _____ Department: _____

Telephone: _____

Location: _____

Figure 25-1. Model policy for workplace threats and violence.

- Statement that he or she would like something bad to happen to a supervisor or another co-worker.
- Paranoid behavior.
- Sudden increase in absenteeism.
- Sexually harassing or obsessing about a co-worker; sending unwanted e-mails, gifts, notes, calls, or stalking.
- Increased demand on supervisor's time.
- Alcohol or drug abuse.
- Talking to oneself.
- Instability in family relationships.
- Financial problems combined with not receiving a raise or promotion.
- Poor relationships with co-workers or management.
- History of violent behavior.
- Previous threats, direct or indirect.
- Presenting and talking about reading material that is violent in nature.
- Carrying a concealed weapon, or flashing one around.
- Quiet seething, sullenness.
- Sudden mood swings, depression.
- Refusal to accept criticism about job performance.
- Sudden refusal to comply with rules or refusal to perform duties.
- Inability to control feelings, outburst of rage, swearing, slamming doors, etc.

If an employee begins demonstrating any or a combination of the above indicators, it is important that management refers him or her to the employee assistance program (EAP) or other counseling services as soon as possible. It is imperative to respond in an emphatic, caring, and non-shaming manner, remembering that time is of the essence.

Supervisors and managers may be more aware of certain indicative behaviors that co-workers might not be aware of. Such as:

- Unexplained increase in absenteeism.
- Noticeable decrease in personal hygiene and appearance.
- Frequent vague physical complaints (company nurse take note of this).
- Increased use of alcohol or drugs.
- Repeated violations of company rules and policies.
- Comments indicating suicidal tendencies or thoughts.
- Telling co-workers of a plan to solve all his/her problems.

Supervisors or managers need to be aware of the five warning signs of escalating behavior especially when conversing or counseling with a worker. These warning signs can be found in Figure 25-2.

FIVE WARNING SIGNS OF ESCALATING BEHAVIOR	
Warning signs	Suggested responses
Confusion	
Behavior characterized by bewilderment or distraction. Unsure or uncertain of the next course of action.	<ul style="list-style-type: none">• Listen to their concerns.• Ask clarifying questions.• Give them factual information.
Frustration	
Behavior characterized by reaction or resistance to information. Impatience. Feeling a sense of defeat in the attempt of accomplishment. May try to bait you.	<ul style="list-style-type: none">• See steps above.• Relocate to quiet location or setting.• Reassure them.• Make a sincere attempt to clarify concerns.
Blame	
Placing responsibility for problems on everyone else. Accusing or holding you responsible. Finding fault or error with the action of others. They may place blame directly on you. Crossing over to potentially hazardous behavior.	<ul style="list-style-type: none">• See steps above.• Disengage and bring second party into the discussion.• Use teamwork approach.• Draw person back to facts.• Use probing questions.• Create “yes” momentum.
Anger—judgment-call required	
Characterized by a visible change in body posture and disposition. Actions include pounding fists, pointing fingers, shouting or screaming. This signals very risky behavior.	<ul style="list-style-type: none">• Use venting techniques.• Don’t offer solutions.• Don’t argue with comments made.• Prepare to evacuate or isolate.• Contact supervisor and/or security.
Hostility—judgment-call required	
Physical actions or threats appear imminent. Acts of physical harm or property damage. Out-of-control behavior signals they have crossed over the line.	<ul style="list-style-type: none">• Disengage and evacuate.• Attempt to isolate person if it can be done safely.• Alert supervisor and contact security immediately.

Figure 25-2. Five warning signs of escalating behavior. (Courtesy of Minnesota Department of Labor and Industry.)

Reporting Practices

A formalized reporting practice should be instituted. Employees should know what to do if an incident of workplace violence occurs. They should be told that the employer wants and will do the following:

- Encourage employee to report and log all incidents and threats of workplace violence.
- Provide prompt medical treatment after the incident.
- Report violent incidents to the local police.
- Inform victims of their legal rights to prosecute perpetrators.
- Discuss the circumstance of the incident with staff members. Encourage employees to share information about ways to avoid similar situations in the future.
- Offer stress debriefing sessions and post-traumatic counseling services to help workers recover from a violent incident.
- Investigate all violent incidents and threats, monitor trends in violent behavior by type or circumstance, and institute corrective actions.
- Discuss changes in the program during regular employee meetings.

You should have a standard for addressing workplace violence incidents. An example of such a form is found in Appendix J. This can be used by supervisors, managers and employees.

PROGRAM DEVELOPMENT AND THE ESSENTIAL ELEMENTS

Management Commitment and Employee Involvement

Commitment and involvement are essential elements in any safety and health program. Management provides the organizational resources and motivating forces necessary to deal effectively with safety and security hazards. Employee involvement, both individually and collectively, is achieved by encouraging participation in the worksite assessment, developing clear effective procedures and identifying existing and potential hazards. Employee knowledge and skills should be incorporated into any plan to abate and prevent safety and security hazards. The two major components are:

- Commitment by top management.
- Employee involvement.

Hazard Identification and Analysis

Worksite hazard identification/analysis identifies existing hazards and conditions, operations and situations that create or contribute to hazards, and areas where hazards may develop. This includes close scrutiny and tracking of injury/illness and incident records to identify patterns that may indicate causes of aggressive behavior and assaults. The objectives of worksite hazard identification/analyses are to recognize, identify, and to plan to correct security hazards. Analysis utilizes existing records

and work site evaluations should include record review and identification of security hazards.

- Record Review.
- Identification of Security Hazards.

Hazard Prevention and Control

Select work settings to apply methods of reducing hazards. You will need to make use of general engineering concepts, maintenance, general building, workstation, and area designs; specific engineering and administrative controls, work practice controls and personal protective equipment as appropriate to control hazards.

Training and Education

A major program element in an effective safety and security program is training and education. The purpose of training and education is to ensure that employees are sufficiently informed about the safety and security hazards to which they may be exposed and thus are able to participate actively in their own and their co-workers' protection. All employees should be periodically trained in the employer's safety and security program.

Training and education are critical components of a safety and security program for employees who are potential victims of assaults. Training allows managers, supervisors, and employees to understand security and other hazards associated with a job or location within the facility, the prevention and control of these hazards, and the medical and psychological consequences of assault. Specific training initiatives that should be included in the workplace violence program are:

- All workers and new hires.
- Job specific training.
- Initial training program.
- Training for supervisors and managers, maintenance and security personnel.

Medical Management

A medical program that provides knowledgeable medical and emotional treatment should be established. This program shall assure that victimized employees are provided with the same concern that is shown to the victims. Violence is a major safety hazard in psychiatric and acute care facilities, emergency rooms, homeless shelters, and other health care settings. Medical and emotional evaluation and treatment are frequently needed but often difficult to obtain.

The consequences to employees who are abused by others may include death or severe, life-threatening injuries, in addition to short and long-term psychological trauma, post-traumatic stress, anger, anxiety, irritability, depression, shock, disbelief, self-blame, fear of returning to work, disturbed sleep patterns, headache, and change in relationships with co-workers and family. All have been reported by workers after assaults, particularly if the attack came without warning. They may also fear criti-

cism by managers, increase their use of alcohol and medication to cope with stress, suffer from feelings of professional incompetence, physical illness, powerlessness, increase absenteeism, and experience performance difficulties.

Record-Keeping

Within the major program elements, record-keeping is the heart of the program, providing information for analysis, evaluation of methods of control, severity determinations, identification of training needs and overall program evaluations.

Evaluation of the Program

Procedures and mechanisms should be developed to evaluate the implementation of the safety and security programs and to monitor progress and accomplishments. Top management and supervisors should review the program regularly. Semi-annual reviews are recommended to evaluate success in meeting goals and objectives.

HIGH-RISK EMPLOYEES

All high-risk employees should be identified so that steps can be taken to better protect them. These are employees who work:

- Late night or early morning hours.
- Alone or in a low-staffed environment.
- With money or prescription drugs.
- In direct contact with the public.
- In a company or facility with chronic labor/management disputes.
- Directly with a person with a history of violent behavior/drug use.

Research into the causes of the increasing incidence of death and serious injury to health care workers has led to the theory that exposure to the public may be an important risk. The risk is increased particularly in emotionally charged situations with mentally disturbed persons or when workers appear to be unprotected.

It is the employers' responsibility to provide a workplace free from hazards that could cause death or serious physical harm and this includes workplace violence. Thus, the employer of today must take into consideration the security of his/her workplace in order to ensure that employees can perform their work without the interference of outside sources of danger.

TYPES OF WORKPLACE VIOLENCE

Often violence in the workplace is committed by someone from outside the office building or company. Therefore, when possible it is important to have surveillance at the entrance of the office building. The following situations indicate a potential threat:

- The spouse or partner of an employee who is in an abusive relationship.

- Rejected suitors, partners involved in divorce or separation procedures.
- Ex-employees who have been fired or laid off.
- Disgruntled customers.
- Persons committing armed robbery.

Types of workplace violence come in a variety of forms. These types of violence are strangers, customers or clients, co-workers, and personal relations. The following is a description of these types of violence:

- **Type 1: Violence by strangers**—Involves verbal threats, threatening behavior, or physical assaults from those having no legitimate business relationship to the workplace. The person enters the affected workplace to commit robbery or other criminal act. Violence by strangers is responsible for the majority of fatal injuries related to workplace violence nationally. Workplaces at the greatest risk of violence from strangers are late-night establishments and taxi cabs.
- **Type 2: Violence by customers and clients**—Involves verbal threats, threatening behavior and physical assaults by an assailant who either receives services from or is under custodial supervision of the affected workplace or the victim. Assailants can be current or former customers or clients, such as passengers, patients, students, inmates, criminal suspects or prisoners. The worker typically provide services to the public, such as municipal bus or rail drivers, health care and social service providers, teachers, sales personnel and other public or private sector service employees. Law enforcement personnel are also at risk of assault, for example from individuals over whom they exert custodial supervision. Violence by customers or clients may occur on a daily basis in certain industries.
- **Type 3: Violence by co-workers**—Involves verbal threats, threatening behavior, or physical assault by an assailant who has employment-related involvement with the workplace—a current or former employee, supervisor, or manager, for example. Any workplace can be at risk of violence by a co-worker. In committing a threat or assault, individuals may be seeking revenge for what is perceived as unfair treatment. This type of violence accounts for a much smaller proportion of fatal workplace injuries than violence by strangers.
- **Type 4: Violence by personal relations**—Involves verbal threats, threatening behavior, or physical assault by an assailant who confronts an individual with whom he or she has or had a personal relationship outside of work. Personal relations include a current or former spouse, lover, relative, friend or acquaintance. The assailant's actions are motivated by perceived difficulties or by psychosocial factors that are specific to the assailant.

PREVENTION STRATEGIES

Usually there are three main areas that must be considered when looking at

attempts to provide security and safety for your workforce due to violent occurrences within and outside your workplace. These strategies are provided to give you some ideas of approaches that could be undertaken in your office building to prevent workplace violence. These strategies are a good starting point.

Environmental Designs

Commonly implemented cash-handling policies in retail settings include procedures such as using locked drop safes, carrying small amounts of cash, and posting signs and printing notices that limited cash is available. It may also be useful to explore the feasibility of cashless transactions in taxicabs and retail settings through use of debit or credit cards, especially late at night. These approaches can be used in any setting where cash is currently exchanged between workers and customers.

Physical separation of workers from customers, clients, and the general public through the use of bullet-resistant barriers or enclosures has been proposed for retail settings, such as gas stations and convenience stores, hospital emergency departments, and social service agency claims areas. The height and depth of the counters (with or without bullet-resistant barriers) are also important considerations in protecting workers, since they introduce physical distance between workers and potential attackers. Consideration must nonetheless be given to the continued ease of conducting business; a safety device that increases frustration for workers, customers, clients, or patients may be self-defeating.

Visibility and lighting are also important environmental design considerations. Making high-risk areas visible to more people and installing good external lighting should decrease the risk of workplace assaults.

Access to and egress from the workplace are also important areas to assess. The number of entrances and exits, the ease with which non-employees can gain access to work areas because doors are unlocked, and the number of areas where potential attackers can hide are issues that should be addressed. This issue has implications for the design of buildings and parking areas, landscaping, and the placement of garbage areas, outdoor refrigeration areas, and other storage facilities that workers must use during a work shift.

Numerous security devices may reduce the risk for assaults against workers and facilitate the identification and apprehension of perpetrators. These include closed-circuit cameras, alarms, two-way mirrors, card-key access systems, panic-bar doors locked from the outside only, and trouble lights or geographic locating devices in taxicabs and other mobile workplaces.

Personal protective equipment such as body armor has been used effectively by public safety personnel to mitigate the effects of workplace violence. For example, the lives of more than 1,800 police officers have been saved by Kevlar vests.

Administrative Controls

Staffing plans and work practices (such as escorting customers and visitors and prohibiting unsupervised movement within and between work areas) are issues that need to be addressed regarding security. Increasing the number of staff on duty may also be appropriate in any number of service and retail settings. The use of security guards or receptionists to screen persons entering the workplace and controlling access to actual work areas has also been suggested by security experts.

Work practices and staffing patterns during the opening and closing of establishments and during money drops and pickups should be carefully reviewed for the increased risk of assault they pose to workers. These practices include having workers take out garbage, dispose of grease, store food or other items in external storage areas, and transport or store money.

Policies and procedures for assessing and reporting threats allow employers to track and assess threats and violent incidents in the workplace. Such policies should clearly indicate a zero tolerance of workplace violence and provide mechanisms by which incidents can be reported and handled. In addition, such information allows employers to assess whether prevention strategies are appropriate and effective. These policies should also include guidance on recognizing the potential for violence, methods for defusing or de-escalating potentially violent situations, and instruction about the use of security devices and protective equipment. Procedures for obtaining medical care and psychological support following violent incidents should also be addressed. Training and education efforts are clearly needed to accompany such policies.

Behavioral Strategies

Training employees in nonviolent response and conflict resolution has been suggested to reduce the risk that volatile situations will escalate to physical violence. Also critical is training that addresses hazards associated with specific tasks or worksites and relevant prevention strategies. Training should not be regarded as the sole prevention strategy but as a component in a comprehensive approach to reducing workplace violence. To increase vigilance and compliance with stated violence prevention policies, training should emphasize the appropriate use and maintenance of protective equipment, adherence to administrative controls, and increased knowledge and awareness of the risk of workplace violence.

SUMMARY

Workplace safety and health hazards affecting employees have traditionally been viewed as arising from unsafe work practices, hazardous industrial conditions, or exposures to harmful chemical, biologic or physical agents, not from violent acts committed by other human beings. Recently though, employees as well as supervisors and managers have become all too frequently, victims of assaults or other violent acts in the workplace that entail a substantial risk of physical or emotional harm. Many of these assaults result in fatal injury, but an even greater number result in nonfatal injury or in the threat of injury, which can lead to medical treatment, missed work, lost wages and decreased productivity.

A single explanation for the increase in workplace violence is not readily available. Some episodes of workplace violence, such robberies of small retail establishments, seem related to the larger societal problems of crime and substance abuse. Other episodes seem to arise more specifically from employment-related problems.

What can be done to prevent workplace violence? Any preventive measure must be based on a thorough understanding of the risk factors associated with the various types of workplace violence. And even though our understanding of the factors that lead to workplace violence is not perfect, sufficient information is available

which, if utilized effectively, can reduce the risk of workplace violence. However, strong management commitment and the day-to-day involvement of managers, supervisors, employees and labor unions are required to reduce the risk of workplace violence.

Workplace violence has become a serious occupational health problem requiring the combined efforts of employers, employees, labor unions, government, academic researchers, and security professionals. The problem cannot be solved by government alone. It is the owner's and employer's efforts that will do the most to protect those within the office building environment (see Figure 25-3).

Workplace Violence Checklist

The following items serve merely as an example of what might be used or modified by employers to help identify potential workplace violence problems.

This checklist helps identify present or potential workplace violence problems. Employers also may be aware of other serious hazards not listed here.

Designated competent and responsible observers can readily make periodic inspections to identify and evaluate workplace security hazards and threats of workplace violence. These inspections should be scheduled on a regular basis: when new, previously unidentified security hazards are recognized; when occupational deaths, injuries, or threats of injury occur; when a safety, health or security program is established; and whenever workplace security conditions warrant an inspection.

Periodic inspections for security hazards include identifying and evaluating potential workplace security hazards and changes in employee work practices that may lead to compromising security. Please use the following checklist to identify and evaluate workplace security hazards. **TRUE notations indicate a potential risk for serious security hazards.**

- ☐ T ☐ F This industry frequently confronts violent behavior and assaults of staff.
- ☐ T ☐ F Violence has occurred on the premises or in conducting business.
- ☐ T ☐ F Customers, clients, or co-workers assault, threaten, yell, push, or verbally abuse employees or use racial or sexual remarks.
- ☐ T ☐ F Employees are **NOT** required to report incidents or threats of violence, regardless of injury or severity, to employer.
- ☐ T ☐ F Employees have **NOT** been trained by the employer to recognize and handle threatening, aggressive, or violent behavior.
- ☐ T ☐ F Violence is accepted as "part of the job" by some managers, supervisors, and/or employees.
- ☐ T ☐ F Access and freedom of movement within the workplace are **NOT** restricted to those persons who have a legitimate reason for being there.
- ☐ T ☐ F The workplace security system is inadequate; i.e., door locks malfunction, windows are not secure, and there are no physical barriers or containment systems.

- | | | |
|----------------------------|----------------------------|--|
| <input type="checkbox"/> T | <input type="checkbox"/> F | Employees or staff members have been assaulted, threatened, or verbally abused by clients and patients. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Medical and counseling services have NOT been offered to employees who have been assaulted. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Alarm systems such as panic alarm buttons, silent alarms, or personal electronic alarm systems are NOT being used for prompt security assistance. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | There is no regular training provided on correct response to alarm sounding. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Alarm systems are NOT tested on a monthly basis to assure correct function. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Security guards are NOT employed at the workplace. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Closed circuit cameras and mirrors are NOT used to monitor dangerous areas. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Metal detectors are NOT available or NOT used in the facility. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Employees have NOT been trained to recognize and control hostile and escalating aggressive behaviors, and to manage assaultive behavior. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Employees CANNOT adjust work schedules to use the "buddy system" for visits to clients in areas where they feel threatened. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Cellular phones or other communication devices are NOT made available to field staff to enable them to request aid. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Vehicles are NOT maintained on a regular basis to ensure reliability and safety. |
| <input type="checkbox"/> T | <input type="checkbox"/> F | Employees work where assistance is NOT quickly available. |

*This form was taken from: *Guideline for Preventing Workplace Violence for Health Care and Social Service Workers*. OSHA 3148: 1996.

Figure 25-3. Workplace violence checklist.

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- California Department of Labor. *Guidelines for Security and Safety of Health Care and Community Service Workers*. <http://www.ca.gov>. Sacramento: March 1998.
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CHAPTER 26

PARKING LOT SECURITY



Typical flat parking area for office buildings.

Since most workers get to their office workplace via an automobile, it is imperative that parking be an integral part of the workplace. Parking areas are often somewhat removed from the office building proper and thus more difficult to institute effective security procedures. Nevertheless security is an expectation that workers hold and this includes their movement from the office building itself to their cars. It has become a part of security and employment that the owner/employer is expected to provide for the safety of office workers who park their cars in the company's parking lots. This chapter deals with that issue of security in parking facilities.

PARKING AREAS

Parking lot or garage security is also closely allied with safety in general. A

secure parking area is somewhat safer for those using it. Although simple rules can be followed to make using parking areas safer, better designed parking areas and adequate security systems definitely decrease the risk and increase the safety of those who park there.

Parking lots come in all shapes and sizes from the high-rise parking garage or underground multi-level structures to the small flat lot of the smaller office building. While having parking available where one is employed is a great advantage it also poses some real hazards. When trying to design for security it is important that one consider the type of parking, the location, and the crime history. Each parking area poses unique risks regarding safety.

Security personnel have known for a long time that parking lots are a favorite target for criminals. Recently a study by Liability Consultants, Inc. of Sudbury, Massachusetts found that more than 1,000 liability lawsuits between 1992 and 2001, showed that in almost one-third of all cases reviewed the basis of the suit was a murder, rape, robbery, or assault that occurred in a parking lot or garage. All types of parking lots and garages appeared in the cases. The awards either by juries or pretrial settlements averaged between \$1 million and \$2.75 million for homicides.

It is definitely possible for owners of office buildings and employers of workforces in office buildings to provide security for the parking areas affiliated with their office buildings. It needs to be an integral part of doing business to protect your staff and clients.

FACTORS AFFECTING PARKING SECURITY

Design

The design of the parking area can lend itself to natural surveillance. This is most true related to flat lots rather than parking garages where the use of electronic surveillance is usually much better. When at all possible the control of access and egress is a real deterrent to criminal activity, especially if both are in the same location. Also, in most cases those who arrive early get the parking spots that are closest to the office building while those who arrive late often leave late and are furthest from the office building which leaves them more vulnerable when departing. At times, roving patrols can be used to increase security for those who have to park in areas out of surveillance viewing. If desirable, traffic can be routed so that when earlier arrivals leave, their spaces are filled by those arriving at a later time.

Surveillance

A surveillance system is of little use to those in parking lots unless there is the possibility to have a response to an incident. If a parker does not feel that the emergency call boxes are going to elicit a response by security forces or the police during a time of need then they provide no sense of well-being to the parker. The immediate voice contact that one receives in these situations also tends to attract attention by a flashing light or alarm and makes the location of the incident easier to find.

Positioning closed circuit television (CCTV) cameras must be done in a cost-effective manner yet cover those areas that are least visible by natural surveillance. Stairwells and any corridors should have cameras strategically placed to as-

sure the most coverage. The camera alone has proven to be a deterrent to criminal activity (see Figure 26-1).

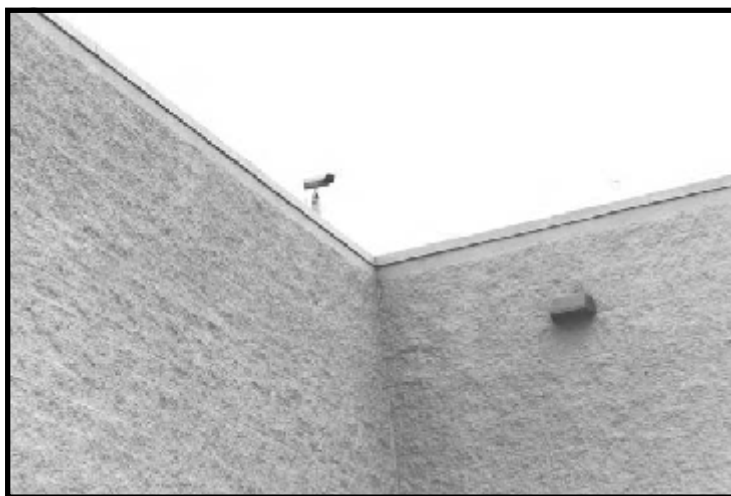


Figure 26-1. Closed circuit television (CCTV) camera overlooking a parking area.

Many facilities are using roving patrols in vehicles, golf carts, or bicycles equipped with radios for quick response. These patrols can contact emergency medical personnel, road service, locksmiths, etc. They are also a consistent and frequent presence at the parking area. The more often the patrols occur the more of a deterrent to crime.

Lighting

Above all else lighting is the most important security measure that can be put to use. The criminal element does not like to be seen and works best under the cover of darkness. Even during daylight hours, high-rise and underground parking facilities need continuous lighting in order to ensure security and increase safety. Lighting increases the effectiveness of CCTV camera and visual acuity of security staff. Even the security staff needs lights to carry out their normal functions such as checking badges at gates, observation, inspecting vehicles, deterring intruders or observing suspicious behavior. The lighting requirement should be sufficient to provide even illumination throughout the parking area without undue glare (see Figure 26-2).

The spaces between vehicles is often the most difficult area to illuminate in a parking area. Lighting should be at the barest minimum 1 foot-candle for self-parking areas and 2 foot-candles for attendant parking. Brighter lighting can be used for more attention but may not be a good economic decision. Entrances, exits, loading zones, and merging lanes should be at least twice the illumination of the actual parking areas. It is interesting to note that CCTV cameras need less light than human eye surveillance to operate effectively but must be positioned so that the camera is not blinded by the rising sun, automobile headlights, and reflections from other parking lot lights.



Figure 26-2. Good illumination in a parking garage.

TYPES OF PARKING

Flat Parking Lots

Flat parking lots should be surrounded by a fence with the entrance and exit at the same point. Having a guard on the gate increases the security. Some office buildings are concerned with aesthetics more than security and safety so that landscaping can become a help to possible perpetrators of crimes by offering shielding and hiding places for them. Large plants may shield the view from the street or sidewalk, which results in blocking the vision of those individuals who could witness an incident and sound the alarm. It may also block the views of your security personnel or even the CCTV cameras. Thus, shrubbery, trees, and other plants should be cut back to miniaturize their size and be kept at no higher than 18 inches. Trees, although providing shade, also interfere with the distribution of parking lot light at night. The lower branches should be kept ten feet from the surface of the lot (see Figure 26-3).



Figure 26-3. A nicely landscaped office building with good visibility.

Night lighting is critical to security. Lighting should allow parkers and employees to note individuals at night at a distance of 75 feet or more, and to identify a human face at about 30 feet, a distance which would allow them, if necessary, to take defensive action or avoidance while still at a safe distance. Although standards suggested earlier recommend a minimum amount of light, a safer amount of illumination of a flat parking lot should be no less than 3 foot-candles on the pavement. Lighting at the entrance should be substantially more by 5 to 6 times, the previous amount.

Lighting does not have to be at the level of an indoor work area, but it should be bright enough for CCTV cameras to operate effectively. You will need more lighting in order for security staff to be able to view the parking area since the human eye is not as sensitive in darker areas as the camera. Cameras are recommended and should be installed to cover the maximum amount of parking lot area.

Emergency call boxes can be installed which will provide direct voice contact when an incident arises. Swipe cards can be used so that they can control the opening and closing of the entry and exit of the lot, although someone can quickly sneak in during the time of the opening and closing of the gate. Escort services can be used for night access or in high risk/crime areas for employees.

It is also best to have a visitor or client parking area that is separate from the secure area for staff members and employees. This is not to imply that you should not take into consideration the security of those visiting your office building since lawsuits are more likely to come from that group if accosted or injured.

Each flat parking lot has its idiosyncrasies, so the security of your parking lot will have to be addressed on a case-by-case basis due to configurations and operating requirements.

Garage Parking

Garages may be multi-level above-ground structures or underground parking areas. These types of structure should have controlled access with a parking lot attendant who can monitor both the coming and going of parkers at the same point (see Figure 26-4). It should have a CCTV camera recording license tags and drivers' faces for maximum control. This is a major deterrent to criminals. Any ground level doors should not be accessible from the exterior of the office building, nor should there be any openings in the building walls within 15 feet of the surface for above-ground parking structures. You do not want individuals entering the parking structure without being monitored. At all potential areas where a breach of the parking structure could occur you will want to install CCTV cameras.

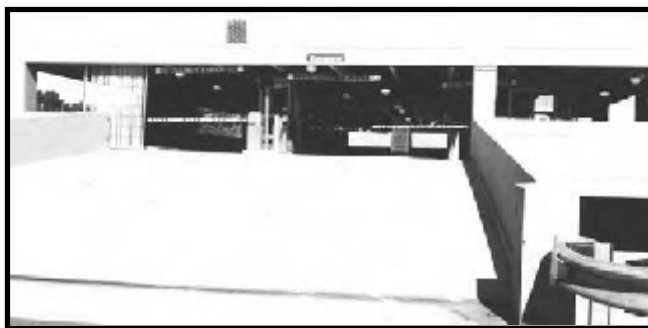


Figure 26-4. Controlling the entrance and exit of parking areas. One way in and one way out.

Covered/enclosed property areas can be areas of very high risk since you have many floors, isolated areas, and locations that are difficult to adequately monitor or conduct effective surveillance. It would be wise to have live and recorded CCTV coverage for each floor, hallway, stairwell, entrance, exit, and elevator. It is certainly best if workers can leave their vehicles and enter the office building without having to go outside of the parking structure to enter. Signs should be posted indicating that surveillance is live or being recorded.

Lighting in interior garages should be a minimum of 5 foot-candles throughout the garage 24 hours per day. Sunlight seldom enters interiors of parking garages and cannot be relied upon for illumination. If the risk is higher for your particular structure then you may use a higher level of illumination. For vehicle and pedestrian inspection points, the illumination should be at least 15–20 foot-candles. Energy-efficient metal-halide lighting provides reasonable color rendition for CCTV and direct viewing. The new high-resolution cameras can be used in areas of limited light effectively. It does help if the interior walls and ceiling are painted with glossy white paint to increase the reflection of light from them. This also increases the ability of parkers to observe movement and potential threats. Pillars and ramp corners should be painted in contrasting colors for driving safety (see Figure 26-5).



Figure 26-5. Illumination inside a parking structure can change depth perception and create dark areas.

Interior and exterior stairwells should be visible, either through the use of no walls on the stairwell or glass-type walls. This “open” approach deprives criminals of a place to hide and assault their victims, while providing parkers with an early warning of potential danger. Stairwells should be well lit (see Figure 26-6).

Emergency call boxes, “panic alarms” and intercom systems often have large, red mushroom-shaped buttons with blue-flashing lights to indicate their location. When pushed, the button activates an intercom connected to a security office or the parking attendant, who can provide directions and summon aid. If the attendant has surveillance duties, he or she should be able to see CCTV monitors on a roving basis and be more than a monitor with his or her nose in a book. A good attendant becomes another spoke in the security wheel. Emergency boxes should be mounted five feet above the surface to ensure visibility. High visibility signage or lights at six or seven feet above the boxes will increase their visibility (see Figure 26-7).



Figure 26-6. Multi-level parking with glass enclosed stairwells.



Figure 26-7. Area of refuge and security.

The use of uniformed security officers on continuous patrol on all levels of the garage, while costly, can also be a significant deterrent to criminals and a reassurance to employees. In order to assure patrols are fulfilling their assignments, a patrol tracking system can be employed or developed.

TRAINING OF STAFF

All staff should be trained in parking area safety and told when and where to report suspicious activities to the proper security personnel or authorities. Each staff member who is adequately trained becomes a deterrent and another pair of eyes for your security effort.

WORKERS' PERSONAL SAFETY

Parking areas are danger zones. You are vulnerable to assault as you travel from a crowded workplace to the relative safety of your vehicle. This is particularly true at night and off-shift hours when there are fewer people around. There are some common sense rules to follow for safety in parking lots and garages or even when parking your vehicle curbside. The following rules should be copied and distributed to employees as part of training or awareness efforts by your company to protect your employees:

- Park only in well-lit areas. Do not park next to vans or thick shrubbery.
- Park near building entrances, rather than in isolated areas of the parking lots or parking garage. Choose a parking space visible from the building lobby or from the street.
- Use parking escort services. Travel to and from your vehicle with co-workers.
- Some employers with large parking lots may supply you with alarm transmitters. If you run into a problem, you can activate the alarm setting off sirens and flashing lights, as well as alerting the security staff.
- Find your vehicle door key before you leave the building for the parking area, so you do not have to search for it in your pocket or handbag when you reach your vehicle.
- Carry your key in your hand in the position you would use to open your door. The key can be used as a weapon if you are threatened. To discourage thieves, carry your wallet in an inside pocket. Hold your purse or briefcase securely, but be prepared to use it as a weapon or let it go rather than risk injury by defending it.
- Wear shoes and clothing comfortable enough so you can run if necessary.
- Look around before you head for your car, watching for loiterers.
- Observe vehicles, particularly vehicles with someone in them. Don't walk near vehicles with darkly-tinted windows which could conceal occupants.

- Do not walk near vans with sliding doors: these can be easily opened to grab a kidnapping victim.
- As you approach your automobile, look under it and beside it to make sure there isn't someone hiding. Before entering the vehicle check in the back seat for a possible intruder.
- If you have a two-door car, get in the habit of flipping the seats forward when you leave the car. If you return and find they have been moved back, you will know someone has been in your car and might still be there. Leave the area and call the police or the parking lot security.
- Be suspicious if you return to your vehicle and find a flat tire. This could be an attempt to put you off your guard so you can be attacked.
- Lock the doors as soon as you enter the vehicle. Keep it locked at all times when you are driving, as well as when you leave it parked.
- In parking garages, avoid isolated areas such as stairwells. You might consider walking down the auto ram instead, if you can do so without risk of being struck by a vehicle.
- If you are staying later than you expect, such as working overtime, move your vehicle to a less isolated spot before it gets dark.
- Don't leave anything of interest in your car that might attract attention and encourage a break-in or robbery attempt. Lock valuables in the trunk.
- Don't leave identifying documents such as insurance papers in the vehicle. Criminals, including stalkers, have been known to break into a woman's car, record the name and address from the registration and rob or attack her at home.
- While a personal parking space is a great perk, don't have your name on it. This information might make you a target.
- Stay alert in parking areas. Watch out for anyone who might mean trouble for you.

SUMMARY

In developing a secure parking strategy, the risk that you are willing to tolerate as well as the liability for not providing adequate security must be determined. This will drive the justification of the cost involved in providing the level of security needed. You will want to operate as cost effectively as possible. You might want to consult your legal counsel to determine the extent of liability that you could incur if you fail to take into account the real risk. As with anything in business, money drives everything.

Many of the recommendation in this chapter are dependent upon the specific configuration and needs of the owners and employers of/in office buildings. Consult a professional if you have unique needs or questions that have not been answered. But, do take time to plan for a secure parking area (see Figure 26-8).

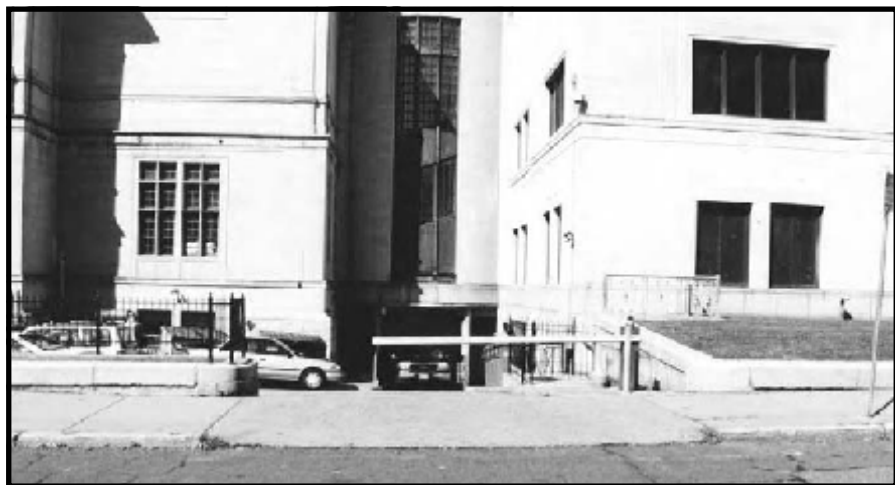


Figure 26-8. A poorly secured parking area.

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CHAPTER 27

SUMMARY



Are workers in these office buildings provided adequate safety and health protection?

Office building safety and health has been an evolving issue as more and more of the American workforce finds itself working in an office environment. Of course some safety and health issues are similar to those faced by other workers in other industry settings, but there are a number of issues that are quite different. Even the setup of the workplace is different with many multi-use and multi-employer office areas in the same building. Thus, the hazards for an office area may not be the same as for all offices.

GENERAL OFFICE SAFETY

A large percentage of workplace accidents and injuries occur in office buildings. Like the shop or laboratory, the office requires a few preventive measures to

ensure a safe and healthful environment. Common causes of office accidents include the following:

- Slipping, tripping, and falling hazards.
- Burning, cutting, and pinching hazards.
- Improper lifting and handling techniques.
- Unobservant and inattentive employees.
- Improper office layout and arrangement.
- Dangerous electrical wiring.
- Exposure to toxic substances.
- Horseplay.

The office building is not a sterile working environment; common workplace hazards can be extra dangerous when you ignore them.

OFFICE SAFETY PROCEDURES

Following safe work procedures in the office can prevent many accidents. Running in offices must be prohibited. Those walking in a passageway should keep to the right. Accidents result when persons stand in front of doors, so employees should stand away from the path of the door swing. Employees should not attempt to carry stacks of materials that are high enough to obstruct vision. If an elevator is available, it should be used instead of carrying stacks of material up flights of stairs.

Proper attention should be given to the act of ascending or descending stairs. Stairways should not be areas for congregation. Those using the stairs should not crowd or push. Falls on stairs occur when people are distracted through conversation or by turning to another person while descending. Individuals should not stand near doors at stairways.

Fall hazards can be prevented through good housekeeping in the office. Spilled liquids should be cleaned up immediately, and loose objects and broken glass should be removed when first noticed. Broken glass should be immediately vacuumed or swept, and the fine pieces should be picked up with a damp cloth.

Poor sitting habits can also lead to falls. Rolling in one's chair across the floor, leaning sideways in a chair to pick up objects from the floor, and leaning back in the chair with feet on the desk are excellent examples of poor office safety procedures.

Filing cabinets are a major cause of accidents and should be used with care. The safe office worker will:

- Close all file drawers immediately after use.
- Close the file drawer with the drawer handle and not with his or her feet.
- Open only one file drawer at a time to avoid toppling the file cabinet.
- Never leave an open drawer unattended and never open a drawer if someone is underneath it.
- Never climb on open file drawers.

- Remove small stools (used to access upper file cabinet drawers) from passageways and safely store them.
- Wear finger guards to avoid paper cuts.

Other unsafe office procedures include storing pencils with the points upward, placing scissors or knives with the point toward the user, using papercutters without proper guards, and placing glass objects on a desk or table edge.

Employees using lounges and eating areas should follow good housekeeping and safe operating procedures to prevent exposure to microwaves and burns from hot plates and coffee makers.

GOOD HOUSEKEEPING PRACTICES

Many office accidents are caused by poor housekeeping practices. By keeping the office floor both neat and clean, you can eliminate most slipping, tripping, and falling hazards. Other good housekeeping practices include the following:

- Ensure that office lighting is adequate and available. Replace burned-out light bulbs, and have additional lighting installed, as necessary.
- Ensure that electrical cords and phone cords do not cross walkways or otherwise pose a tripping hazard. If you cannot move a cord, have a new outlet installed or secure the cord to the floor with cord covering strips. Do not tape cords down or run them underneath carpet.
- Report or repair tripping hazards such as defective tiles, boards, or carpet immediately (see Figure 27-1).
- Clean spills and pick up fallen debris immediately. Even a loose pencil or paper clip on a floor could cause a serious falling injury.
- Keep office equipment, facilities, and machines in good condition.
- Store items in an approved storage space. Take care not to stack boxes too high or too tight. Ensure that boxes are clearly labeled with their contents.



Figure 27-1. Common office area with unsecured carpet in main walking area.

Offices should have an area specifically designed for storing supplies. Materials should be neatly stacked in stable piles with the heaviest pieces on the bottom. Office equipment should not be placed on the edge of a table or desk.

PREVENTING CUTS AND PUNCTURES

Cuts and punctures happen when people use everyday office supplies without exercising care. Follow these guidelines to help reduce the chance for cuts and punctures:

- When sealing envelopes, use a liquid dispenser, not your tongue.
- Be careful when using kitchen knives, scissors, staplers, letter openers, and box openers. Any of these items could cause a painful injury.
- Avoid picking up broken glass with your bare hands. Wear gloves and use a broom and a dustpan.
- Place used blades or broken glass in a rigid container, such as a box, before disposing in a wastebasket.

PREVENTING MACHINE ACCIDENTS

Only use machines that you know how to operate. Never attempt to operate an unfamiliar machine without reading the machine instructions or receiving directions from a qualified employee. In addition, follow these guidelines to ensure machine safety:

- Secure machines that tend to move during operation.
- Do not place machines near the edge of a table or desk.
- Ensure that machines with moving parts are guarded to prevent accidents. Do not remove these guards.
- Unplug defective machines and have them repaired immediately.
- Do not use any machine that smokes, sparks, shocks, or appears defective in any way.
- Close hand-operated paper cutters after each use and activate the guard.
- Take care when working with copy machines. If you have to open the machine for maintenance, repair, or troubleshooting, remember that some parts may be hot. Always follow the manufacturer's instructions for troubleshooting.
- Unplug paper shredders before conducting maintenance, repair, or troubleshooting.

Some items can be very dangerous when worn around machinery with moving parts. Avoid wearing the following items around machines with unguarded moving parts:

- Loose belts.
- Jewelry

- Long, loose hair.
- Long, loose sleeves or pants.
- Scarves.
- Ties.

As mentioned earlier, common office machines, such as the following, require special safety consideration: copiers, microwaves, adding machines, typewriters, and computers. Other office equipment that requires safety consideration includes furniture such as file cabinets and shelves, desks, and chairs.

PREVENTING ELECTRICAL ACCIDENTS

Hazards from electrical equipment can be reduced by:

- Using only UL-listed (Underwriters Laboratories, Inc.) equipment.
- Arranging electrical extension cords to avoid tripping hazards.
- Installing proper receptacles.

Electrical appliances such as coffee makers, radios, and lamps can become sources of fire or electrical shock. Appliances should be equipped with electrical plugs that have a ground prong or the appliance should have been marked “double insulated” by the manufacturer.

Electrical extension cords should not be used as a substitute for permanent wiring. When extension cords are a temporary necessity, they should be taped down, clipped to the back of desks, or covered with a rubber electrical cord guard if they cross the floor (see Figure 27-2).

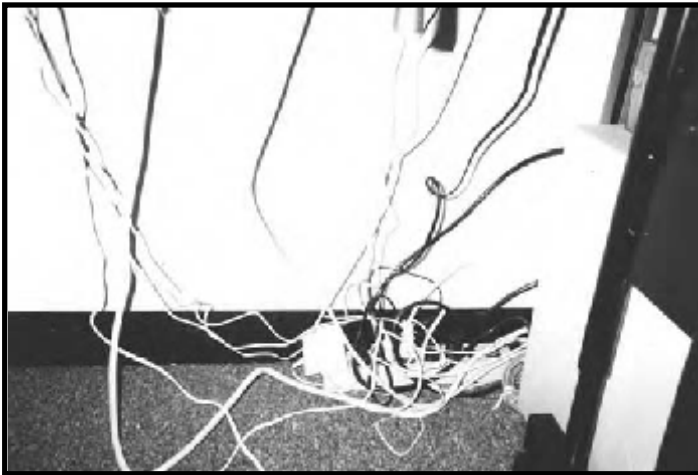


Figure 27-2. Typical overloading of extension cords and receptacles.

The National Electrical Code (NEC), NFPA 70, requires ground fault circuit interrupters (GFCIs) for restroom areas. The GFCI is a fast-acting device that senses current leakage caused by a fault in the electrical circuit. The GFCI shuts off the electricity to interrupt its faulty flow. It is good practice to use GFCIs wherever electrical hazards might develop.

All fuses and circuit breakers must be identified. Place a label on each fuse or circuit breaker switch and a corresponding label on each receptacle and light switch. That practice will reduce time needed to identify a specific fuse or circuit breaker when there is a need to turn it off (see Figure 27-3).



Figure 27-3. A properly secured circuit breaker panel.

PREVENTING SLIPS AND FALLS

The easiest way to avoid slips and falls is to pay attention to your surroundings and to avoid running or rushing. To ensure safety for others in the office, however, follow these guidelines:

- Arrange office furnishings in a manner that provides unobstructed areas for movement.
- Keep stairs, steps, flooring, and carpeting well maintained.

- Ensure that glass doors have some type of marking to keep people from walking through them.
- Clearly mark any difference in floor level that could cause an accident.
- Secure throw rugs and mats to prevent slipping hazards.
- Do not place wastebaskets or other objects in walkways.

Floor surfaces should have a slip-resistant finish. Tripping hazards can be minimized by immediately replacing defective tiles and carpet or worn floor mats. Slip-resistant floor wax can give polished floors a higher coefficient of friction. Floor mats and runners offer a more slip-resistant protection for stairways or lobby entrances.

PREVENTING FILE CABINET AND SHELF ACCIDENTS

Because file cabinets and shelves tend to support heavy loads, treat them with special care. Follow these safety guidelines for file cabinets:

- Secure file cabinets that are not weighted at the bottom. Either bolt them to the floor or to the wall.
- Ensure that file cabinet drawers cannot easily be pulled clear of the cabinet.
- Do not block ventilation grates with file cabinets.
- Open only one drawer at a time to keep the cabinet from toppling.
- Close drawers when they are not in use.
- Do not place heavy objects on top of cabinets. Be aware that anything on top of a cabinet may fall off if a drawer is opened suddenly.
- Close drawers slowly using the handle to avoid pinched fingers.
- Keep the bottom drawer full. This will help stabilize the entire cabinet.

In addition, follow these safety guidelines for office shelves:

- Secure shelves by bolting them to the floor or wall.
- Place heavy objects on the bottom shelves. This will keep the entire structure more stable.
- Ensure that there are at least 18 inches between the top shelf items and the ceiling. This space will allow ceiling sprinklers (if present) to function properly if a fire occurs.
- Do not block ventilation grates with shelves.
- Never climb on shelves (even lower shelves). Use an approved ladder.

PREVENTING DESK ACCIDENTS

Follow these safety guidelines for office desks:

- Keep desks in good condition (e.g., free from sharp edges, nails, etc.).
- Ensure that desks do not block exits or passageways.

- Ensure that glass-top desks do not have sharp edges.
- Ensure that desks with spring-loaded tables function properly. The table should not spring forth with enough force to cause an injury.
- Do not climb on desks. Use an approved ladder.
- Keep desk drawers closed when not in use.
- Repair or report any desk damage that could be hazardous.

PREVENTING CHAIR ACCIDENTS

Safety guidelines for office chairs include the following:

- Do not lean back in office chairs, particularly swivel chairs with rollers.
- Do not climb on any office chair. Use an approved ladder.
- Office desk chairs should have adjustable back supports and seat height. Make sure that your chair's back support position and seat height are comfortable.
- Take care when sitting in a chair with rollers. Make sure it does not roll out from under you when you sit down. Repair or report any chair damage that could be hazardous.
- Do not roll chairs over electrical cords.

PREVENTING LADDER ACCIDENTS

Always use an approved ladder or stool to reach any item above your extended arm height. Never use a makeshift device, such as a desktop, file cabinet, bookshelf, or box, as a substitute for a ladder. Follow these guidelines when using ladders:

- Do not load a ladder above its intended weight capacity.
- Place ladders on slip-free surfaces even if they have slip-resistant feet. Secure the ladder if a slip-free surface is not available.
- Avoid placing ladders in walkways. Secure a ladder if its location could cause an accident.
- Keep areas around ladders clean and free of debris.
- Do not use a ladder in front of a door unless the door is locked and barricaded.

PREVENTING STRESS

To reduce stress and prevent fatigue, it is important to take mini-breaks (not many breaks) throughout the day. If possible, change tasks at least once every two hours. Stretch your arms, neck, and legs often if you do the same type of work for long periods of time. Rest your eyes often by closing them or looking at something

other than the work at hand. For a quick pick-me-up, breathe deeply several times by inhaling through your nose and exhaling through your mouth. In addition, always try to eat your lunch somewhere other than your desk. Other examples of stress-relieving exercises that can be done at your desk include the following:

- **Head and Neck Stretch:** Slowly turn your head to the left, and hold it for three seconds. Slowly turn your head to the right, and hold it for three seconds. Drop your chin gently towards your chest, and then tilt it back as far as you can. Repeat these steps five to ten times.
- **Shoulder Roll:** Roll your shoulders forward and then backward using a circular motion.
- **Upper Back Stretch:** Grasp one arm below the elbow and pull gently towards the other shoulder. Hold this position for five seconds and then repeat with the other arm.
- **Wrist Wave:** With your arms extended in front of you, raise and lower your hands several times.
- **Finger Stretch:** Make fists with your hands and hold tight for one second, then spread your fingers wide for five seconds.

PREVENTING ERGONOMIC PROBLEMS

Workstation Arrangement

With the extensive use of computers and other automated desk devices in the workplace, employees must take special care to ensure proper workstation arrangement. For the purpose of this manual, a workstation consists of the equipment and furniture associated with a typical desk job (e.g., desk, chair, and computer components).

In recent years, computer screens or video display terminals (VDTs) have received much attention concerning nonionizing radiation levels. Tests prove, however, that VDTs do not emit harmful levels of radiation. Improper workstation arrangement combined with repetitive motion, however, may contribute to visual and musculoskeletal fatigue.

Cumulative trauma disorders, such as carpal tunnel syndrome, may result from the stress of repetitive motion. Therefore, it is very important to arrange your workstation properly and to take breaks frequently. Recommendations for ensuring employee comfort through proper work station arrangement of furniture, computers, accessories, and supplies should be formulated for the workers to follow.

Operator's Position

Your seating position at work is important to your comfort and safety. To reduce the painful effects of repetitive motion, follow these guidelines when working with computers or typewriters:

- Always sit straight. Make sure your chair is adjusted to provide adequate support to your back. Place your feet flat on the floor or on a footrest. Lower legs should be approximately vertical, and thighs should be approximately horizontal. The majority of your weight should be on the buttocks.

- Ensure that there is at least 1 inch of clearance between the top of your thighs and the bottom of the desk or table.
- Keep your wrists in a natural position. They should not rest on the edge of the desk.
- Keep the front edge of your chair approximately 4 inches behind your knees.

Equipment Arrangement

By properly arranging your equipment, you can also help reduce the harmful effects of repetitive motion. Follow these guidelines for arranging office equipment:

- **Lighting:** Lighting around computer workstations should illuminate the work area without obscuring the VDT or causing glare. Position computer screens, draperies, blinds, and pictures to reduce glare during work hours (e.g., place the VDT screen at a right angle to the window).
- **VDT Screen:** VDT images should be clear and well-defined. Adjust the screen's brightness, contrast, and display size to meet your needs. If a screen flickers or jumps, have it repaired or replaced. Place the VDT 20-28 inches away from your face. The center of the VDT should be approximately 15 to 25 degrees below your line of vision.
- **Keyboards:** Position computer keyboards so that the angle between the forearm and upperarm is between 80 and 120 degrees. Place the keyboard in an area that is accessible and comfortable.
- **Wrist Support:** Use wrist supports made of padded material. The support should allow you to type without bending your wrists.
- **Document Holders:** Keep documents at approximately the same height and distance from your face as the VDT screen.
- **Telephones:** Neck tension is a common problem caused by holding the telephone between the head and neck. Use a headset or speakerphone if you use the telephone for extended periods of time.

PREVENTING OFFICE ENVIRONMENTAL PROBLEMS

The layout of an office should incorporate the principles of workflow, considering safety and health, efficiency, and convenience. The Life Safety Code (National Fire Protection Association (NFPA) 101) covers specific requirements for stairways, exits, and doors. For example, handrails for stairs are required to be located 30 to 34 inches above the tread surface.

Standards enforced under the Occupational Safety and Health Act also address stairs. Generally speaking, enclosed stairways with four or more risers and less than 44 inches wide require a handrail on one side. Enclosed stairways wider than 44 inches require a handrail for both sides. Regardless of stair width, there must be a stair railing for each open side. An intermediate stair railing is required for stairs wider than 88 inches.

Doors that open onto a passageway pose a hazard to oncoming traffic. Guardrails can be used to minimize that hazard or the floor can be painted to mark the swing area. Exits should be unobstructed and well illuminated. Emergency lighting is required for exit hallways or paths.

Inadequate illumination caused by glare or shadows that interfere with vision can contribute to accidents. Illumination levels should be consistent to reduce visual fatigue created when one moves from bright surroundings into dark ones. The office layout should not require employees to face windows, unshielded lamps, or other sources of glare.

PREVENTING HAZARDOUS OBJECTS AND MATERIALS ACCIDENTS

Hazardous objects such as knives and firearms are not permitted in the workplace. In addition, hazardous chemicals and materials should not be stored in the general office. Hazardous materials include, but are not limited to, the following:

- Carcinogens.
- Combustibles.
- Flammables.
- Gas cylinders.
- Irritants.
- Oxidizers.
- Reactive chemicals.

The inadvertent release of hazardous chemicals into the office environment may cause acute effects as well as long term (chronic health effects). All chemicals should be handled as though they could pose potential harm to office workers.

PREVENTING OFFICE HEALTH PROBLEMS

Most of the health problems faced by workers are or can be linked to the air they breathe. In an office environment indoor air quality is always an area of concern, thus the emphasis placed on the HVAC system in the office building and its care and maintenance. Chemicals, biologicals, and nuclear contaminants have the most access and are most often distributed through the ventilation system. Health issues may range from dermatitis to respiratory disorders. These health problems cannot be taken lightly since they can become chronic and debilitating.

Office buildings are unique and must have safety and health managed; owners and employers should not make the assumption that health and safety will take care of themselves. It is the legal responsibility of the employer to provide a safe and healthy workplace for his or her employees. The tools to accomplish this are embedded in the previous pages of this book. This book should not be considered as the only source of guidance and information, but it is at least a compilation of all the major issues facing an effort to install safety and health within an office building, thus a good resource to start addressing the issue of occupational safety and health in the office environment.

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APPENDIX A

SAMPLE WRITTEN SAFETY AND HEALTH PROGRAM

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SAMPLE WRITTEN SAFETY AND HEALTH PROGRAM¹

Management's Commitment

Safety is a management function which requires management's participation in planning, setting objectives, organizing, directing and controlling the program. Management's commitment to safety and health is evident in every decision the company makes and every action the company takes. Therefore, the management of Name of Company assumes total responsibility for implementing and ensuring the effectiveness of this safety and health program. The best evidence of our company's commitment to safety and health is this written program which will be fully implemented on each company construction project.

Assigning Responsibility

The individual assigned with the overall responsibility and authority for implementing this safety and health program is Name of Individual, Safety Director. Management fully supports the Safety Director and will provide the necessary resources and leadership to ensure the effectiveness of this safety and health program.

The Safety Director will supplement this written safety and health program by:

- Establishing workplace objectives and safety recognition programs.
- Working with all government officials during accident investigations and safety inspections.
- Maintaining safety and individual training records.
- Encouraging reporting of unsafe conditions and promoting a safe workplace (some of these responsibilities will be delegated to supervisors for implementation).

¹Reese, C.D., Moran, J. B., Lapping, K. *Model Construction Safety and Health Program*. Laborers' Health and Safety Fund of North America. Washington, D.C. 1993.

SAFETY AND HEALTH POLICY STATEMENT

To all Employees:

Name of Company is committed to providing a safe and healthful workplace that is free from recognized hazards. The safety and health of our employees is one of the highest priorities of the Name of Company. It is the policy of this company that accident prevention will be given primary importance in all phases of operation and administration. Therefore, management has developed this safety and health program to reduce injuries and illnesses that are so prevalent in office buildings.

The effectiveness of this program depends upon the cooperation and communication of management officials, supervisors and employees. Everyone must be capable of recognizing hazards in the workplace and understand his or her role. Each supervisor will make the safety and health of all employees an integral part of his/her regular management function. In addition, each employee will adhere to established company safety rules and procedures. Participation of all employees is essential in order to ensure the effectiveness of this program.

Management will make every effort to provide adequate safety training to employees prior to allowing an employee to begin work. Employees in doubt about how to do a job or task safely are required to ask a qualified person for assistance. Employees must report all injuries and unsafe conditions to management as soon as possible so that corrective measures can be taken to prevent future accidents.

Please read this safety and health program and follow the safe work procedures described. Safety is everyone’s business and everyone (management officials, supervisors, employees) will be held accountable for participating in this program.

Please think Safety and always work safely.

President

Company Safety Goals and Objectives

- On each Name of Company office building, the superintendent will be accountable to management for the successful achievement of targeted company safety and health goals. Name of Company’s safety and health goals are:
- Zero fatalities or serious injuries.
 - Reduce injuries, lost workday accidents and workers’ compensation claims.
 - Prevention of damage or destruction to company property or equipment.

- Increased productivity through reduction of injuries.
- Reduced workers' compensation costs.
- Enhance company's image by working safely
- Keep safety a paramount part of the workers' daily activities.
- Recognize and reward safe work practices.
- Improve morale and productivity.

Safety Enforcement Policy

Whenever a violation of safety rules occurs, the following enforcement policy will be implemented:

FIRST OFFENSE—Verbal warning and proper instruction pertaining to the specific safety violation. (A notation of the violation may be made and placed in the employee's personnel file.)

SECOND OFFENSE—Written warning with a copy placed in the employee's personnel file.

THIRD OFFENSE—Receipt of two (2) written reprimands in any 12-month period may result in suspension.

FOURTH OFFENSE—Dismissal from employment.*

* The company reserves the right to terminate immediately any employee who acts unsafely on Name of Company jobsites.

Responsibilities for safety and health include the establishment and maintenance of an effective communication system between management officials, supervisors and workers. To this end, all personnel are responsible for assuring that their messages are received and understood by the intended receiver.

Specific safety and health responsibilities for Name of Company personnel are as follows:

Management Officials

Active participation in and support of safety and health programs are essential. Therefore, all management officials of the Name of Company will display their interest in safety and health matters at every opportunity. At least one manager (as designated) will participate in safety and health meetings, accident investigations and worksite inspections. Each manager will establish realistic goals for accident reduction in his/her area of responsibility and will establish the necessary implementation instructions for meeting the goals. Goals and implementation instructions must be within the framework established by this document. Incentives may be included as a part of implementing instructions.

Supervisors

The safety and health of the employees is a primary responsibility of the supervisors. To accomplish this obligation, supervisors will:

1. Assure that all safety and health rules, regulations, policies and procedures are understood by conducting pre-work safety orientations with all workers and reviewing rules as the job or conditions change or when individual workers show a specific need.
2. Require the proper care and use of all necessary personal protective equipment to protect workers from hazards.
3. Identify and eliminate job hazards expeditiously through hazard analysis procedures.
4. Receive and take initial action on employee suggestions, awards or disciplinary measures.
5. Conduct supervisor meetings the first five minutes of each work day to discuss safety matters and work plans for the work day.
6. Train employees (both new and experienced) in the safe and efficient methods to accomplish each job or task.
7. Review accident trends and establish prevention measures.
8. Attend safety meetings and actively participate in the proceedings.
9. Participate in accident investigations and safety inspections.
10. Promote employee participation in this safety and health program.
11. Actively follow the progress of injured workers and display an interest in their rapid recovery and return to work.

Employees

Safety is a management responsibility; however, each employee is expected, as a condition of employment for which he/she is paid, to work in a manner that will not inflict self-injury or cause injury to fellow workers. Each employee must understand that responsibility for his/her own safety is an integral job requirement. Each employee of Name of Company will:

- Observe and comply with all safety rules and regulations that apply to his/her trade.
- Report all on-the-job accidents and injuries to his/her supervisor immediately.
- Report all equipment damage to his/her supervisor immediately.
- Follow instructions and ask questions of his/her supervisor when in doubt about any phase of his/her operation.
- Report all unsafe conditions or situations that are potentially hazardous.
- Operate only equipment or machinery that he/she is qualified to operate. When in doubt, ask for directions.
- Know what emergency telephone numbers to call in case of fire and/or personal injury.
- Help to maintain a safe and clean work area.

- Talk with management at any reasonable time concerning problems that affect his/her safety or work conditions.

The most important part of making this program effective is the individual employee. Without your cooperation, the most stringent program can be ineffective. Protect yourself and your fellow workers by following the rules. Remember: Work safely so that you can return home each day the same way you left. Your family needs you and this company needs you! Don't take chances—think safety first!

Competent/Qualified Persons

The Occupational Safety and Health Administration's (OSHA) General Industrial Standards (29 CFR 1910) require every employer to designate competent persons to conduct frequent and regular inspections of the job site, materials, and equipment.

To comply with OSHA competent/qualified person requirements, each project will have a project-competent person capable of identifying existing and predictable hazards with the authority to take prompt corrective measures to eliminate them. This individual may designate other competent persons to perform certain tasks, such as supervising scaffold erection.

Competent/qualified persons should be designated for each office building on a form developed by the safety department. This form will be completed and displayed at all operations requiring the presence of a competent/qualified person. The form should be updated and replaced as necessary to reflect current designated competent/qualified persons and their area of expertise and responsibility.

The core of an effective safety and health program is hazard identification and control. Periodic inspections and procedures for correction and control provide methods of identifying existing or potential hazards in the workplace, and eliminating or controlling them. The hazard control system provides a basis for developing safe work procedures, and injury and illness prevention training. Hazards occurring or recurring reflect a breakdown in the hazard control system.

This written safety and health program establishes procedures and responsibilities for the identification and correction of workplace hazards. The following activities will be used by this company to identify and control workplace hazards:

- Workplace inspections.
- Accident investigation.
- Safety and health committee.

Jobsite Safety Inspections

Safety inspections of the jobsite will occur periodically every Insert Frequency, when conditions change, or when a new process or procedure is implemented. These inspections should focus on the identification and correction of potential safety, health and fire hazards. Individuals should use the site evaluation worksheet when conducting jobsite safety inspections. In addition, the safe work procedures should be reviewed by personnel conducting safety inspections of the jobsite.

As part of this safety and health program, the supervisor for each company will:

- Identify “high hazard” areas of operation and determine inspection priorities.
- Establish inspection responsibilities and schedules.
- Develop an administrative system to review, analyze and take corrective action on inspection findings.

Accident Investigation

All accidents will be investigated to determine causal factors and prevent future recurrences of similar accidents. A written report of investigation findings will be prepared by each injured employee’s supervisor and submitted to management for review. Written reports for accidents resulting in fatalities or serious injuries will also be submitted to company attorneys.

Whenever an accident is reported, the supervisor of the injured workers should respond to the scene of the accident as soon as possible and complete the supervisor’s accident report. All witnesses should be interviewed privately as soon as possible after the accident. If possible, the supervisor should interview the workers at the scene of the accident so that events leading up to the accident can be re-enacted.

Photographs should be taken as soon as possible after the accident and include the time and date taken.

Supervisors are required to submit accident investigation reports that answer the questions: who, what, when, where and why:

- Who was involved? The investigation report should identify the injured worker’s name and occupation.
- What happened? The investigation report should describe the accident, the injury sustained, eyewitnesses, the date, time and location of the accident.
- Why did the accident occur? All the facts surrounding the accident should be included here, including but not limited to the following:
 - What caused the situation to occur?
 - Were the workers qualified to perform the function involved in the accident?
 - Were they properly trained?
 - Were operating procedures established for the task involved?
 - Were procedures followed, and if not, why not?
- Where else might this or a similar situation exist, and how can it be avoided?
- What should be done? Methods for preventing future accidents of a similar nature should be identified.
- What has been done? A follow-up report will be completed by the site safety representative to determine if the suggested action was implemented, and, if so, whether similar accidents were prevented as a result of such implementation.

Safety and Health Committee

Each Name of Company worksite will establish a safety and health committee to assist with implementation of this program and the control of identified hazards. The safety and health committee will be comprised of employees and management representatives. The committee should meet regularly, but not less than once a month. Written minutes from safety and health committee meetings will be available and posted on the project bulletin board for all employees to see.

The safety and health committee will participate in periodic inspections to review the effectiveness of the safety program and make recommendations for improvement of unsafe and unhealthy conditions. This committee will be responsible for monitoring the effectiveness of this program. The committee will review safety inspection and accident investigation reports and, where appropriate, submit suggestions for further action. The committee will also, upon request from OSHA, verify abatement action taken by Name of Company in response to safety and health citations.

Objectives of Project Labor/Management Safety and Health Committee

1. Reduce accidents through a cooperative effort to identify and eliminate as many unsafe conditions and acts as possible.
2. Promote employee training in areas of recognition, avoidance, and prevention of workplace hazards.
3. Encourage employee participation in the company safety and health program.
4. Establish a line of communication for the worker to voice his/her concerns on existing or potential hazards and receive positive feedback.
5. Develop a mechanism that enables workers to provide suggestions on how to improve safety and health on the jobsite.
6. Provide a forum for joint labor-management cooperation on safety and health issues in the workplace.

Functions of Project Labor/Management Safety and Health Committee

1. Involve workers in problem-solving.
2. Examine accident and injury statistics and set safety objectives.
3. Communicate accident prevention information to the workforce.
4. Review reports of recent accidents.
5. Identify and correct hazardous conditions and practices.
6. Assist in identifying the causes of hazards.
7. Regularly review minutes of previous meetings to ensure that action has been taken.

Monthly Project Safety Meeting

A monthly safety meeting will be conducted on each worksite/jobsite to provide affected parties with relevant information concerning existing or potential worksite hazards, corrective actions and/or abatement. Minutes from these meetings should be recorded and a copy sent to the corporate safety office. The following parties should attend these monthly safety meetings:

- Company president/CEO or designated representative.
- Middle manager.
- Supervisor.
- Forepersons.
- Safety and health representative.

All employees from managers to workers will receive safety education and training through all phases of work performed by Name of Company. The following safety education and training practices will be implemented and enforced at all company projects/jobsites.

New-Hire Safety Orientation

New employees or current employees who are transferred from another project must attend a project specific new-hire safety orientation. This program provides each employee the basic information about the Name of Company worksite safety and health rules, federal and state OSHA standards, and other applicable safety rules and regulations. Employee attendance is mandatory prior to working in the office building. The site superintendent will record attendance using the new-hire safety orientation form and maintain a file documenting all workers who attend new hire safety orientation.

The project/jobsite safety orientation program will introduce new employees to:

- Company safety and health program and policy.
- The project/jobsite and the employee's role within it.
- Hazard communication requirements.
- Emergency procedures.
- ^a Location of first aid stations, fire extinguishers, telephones, lunchroom, washroom, and parking.
- Site-specific hazards.
- Safety and health responsibilities.
- Reporting of injuries and hazardous conditions.
- Use of personal protective equipment.
- Tool handling and storage.
- Review of each safety and health rule applicable to the job.
- Introduction to safety and health representatives.

- Introduction to supervisor.
- Site tour or map where appropriate.

Management understands that a new employee can absorb only so much information in the first few days. Therefore, each new employee will be paired with a veteran employee who can reinforce the new employee's training while, at the same time, raising the safety awareness of the experienced "buddy."

Supervisor Training

The supervisor/foreman is responsible for the prevention of accidents for tasks under his/her direction, as well as thorough accident prevention and safety training for employees he/she supervises. Therefore, all supervisors/foremen will receive training so that they have a sound theoretical and practical understanding of the following:

- The site-specific safety program.
- OHSAct and applicable regulations.
- OSHA Hazard Communication standard.
- Site emergency response plan.
- First aid and CPR.
- Accident and injury reporting and investigation procedures.
- Hazard assessment in their areas of expertise, and topics appropriate for toolbox talks.
- OSHA record-keeping requirements.
- Communication techniques.

In addition to the training requirements described above, managers will receive additional training on, but not limited to, the following topics:

- Implementation and monitoring of the company's safety program.
- Personnel selection techniques.
- Job site planning.
- Contractor supervision.
- Worksite documents.
- OSHA record-keeping requirements.

Safety Bulletin Board

A safety bulletin board will be located on each worksite/job site where it will be visible to all employees. The bulletin board will contain information such as:

- Safety and health committee meeting minutes.
- Safety promotions/awards.
- Safety meeting dates and times.
- OSHA 200 Form (February of each year).

- Available safety training.
- Safety inspection findings.
- Emergency phone numbers.

Additional items may be posted with the management's approval.

Safety Talks

Supervisors/forepersons will conduct weekly work group sessions, also known as safety talks, each _____ immediately prior to start of work. These safety talks may be held more frequently depending on the circumstances (e.g., fatality, injury, new operations, etc.) The supervisor/foreperson will provide appropriate materials (handouts, audio/visual aids, etc.) to discussion leaders in advance of each meeting. Discussion leaders will be selected for each meeting by the supervisor/foreman.

These weekly meetings should not exceed 15 minutes. Active employee participation and a question-and-answer session are recommended during each meeting.

Meetings will be scheduled whenever new operations are introduced into the workplace to ensure that all employees are familiar with the safe job procedures and requirements for performing the job safely.

Employee attendance at safety meetings must be recorded on the employee training record form. If discussion at the meeting identifies a suspected safety or health hazard, a copy must be forwarded to the site superintendent.

Various types of reports are necessary to meet OSHA record-keeping requirements, insurance carriers, and other government regulatory agencies. Additionally, some clients may require additional site record-keeping requirements.

The Name of Company has established uniform record-keeping procedures for all company worksites/jobsites to measure the overall safety and health performance of each project.

OSHA Records

The Occupational Safety and Health Administration (OSHA) requires Name of Company to record and maintain injury and illness records. These records are used by management to evaluate the effectiveness of this safety and health program. The Safety Director shall be responsible for following the OSHA record-keeping regulations listed below:

- Obtain a report on every injury or illness requiring medical treatment.
- Record each injury or illness on the OSHA Log and Summary of Occupational Injuries & Illnesses (Form 300).
- Prepare a supplemental record of the occupational injuries and illnesses on an Employer's Report of Injury or Illness (Supplementary Record, Form 301).
- Prepare the summary OSHA Form 300, post it no later than February 1, and keep it posted where employees can see it until March 1; provide copies as required or requested.
- Maintain these records in company files for five years.

Medical/Exposure Records

Medical/exposure records will be maintained for 30 years from the time of the end of an employee's employment unless a different retention period is specified by a specific standard. These records are confidential information and will remain in the custody of the Safety Director. Information from an employee's medical record will be disclosed only to the employee or his/her designated representative after written consent from the employee.

All employees will be informed by posted notice of the existence, location, and availability of medical exposure records at the time of initial employment and at least annually thereafter. Name/Title of Individual is responsible for maintaining and providing access to these records.

Training Records

Training records will be maintained in each employee's personnel file and available for review upon request. Experience indicates that supervisors/foremen who receive basic first-aid and CPR training are much more safety-conscious and usually have better crew safety performance records. Therefore, all field supervisory personnel will be required to attend basic first-aid and CPR training unless they possess a valid first-aid and CPR card issued in their name.

Each Name of Company worksite/jobsite will have adequate first aid supplies and certified, trained personnel available for the treatment of personnel injured on the job. It is also imperative that all treatments be documented in the first aid log. Prompt medical attention should be sought for any serious injury or if there is doubt of an employee's condition.

First Aid Supplies

First-aid supplies will be available and in serviceable condition on each company worksite. Items which must be kept sterile in the first-aid kit should be kept in individual packaging. All first-aid kits will contain, but not be limited to, the following items:

- 1 Pkg.—Adhesive bandages, 1" (16 per pkg.).
- 1 Pkg.—Bandage compress, 4" (1 per pkg.).
- 1 Pkg.—Scissors and tweezers (1 each per pkg.).
- 1 Pkg.—Triangular bandage, 40" (1 per pkg.).
- 1 Pkg.—Antiseptic soap or pads (3 per pkg.).

Medical Services

Each Name of Company worksite will have medical services available either on the worksite or at a location nearby. Emergency phone numbers will be posted on the jobsite for employees to call in the event of an injury or accident on the worksite. Nurses will be available from ____ a.m. until ____ p.m. to respond to medical emergencies. First aid will be available from the Name Fire Department at all other times.

Jobsite First Aid Log

A first aid log should be maintained in the Name of Company first aid facility. This log should reflect the following information:

- Injured employee's name.
- Immediate supervisor.
- Date and time of injury.
- Nature of the injury.
- Injured employee's job.
- ^a Treatment rendered and disposition of employee (returned to work or sent for medical attention).

Emergency Procedures

All employee's will be provided with the locations of the first aid stations on each worksite/jobsite. Instructions for using first aid equipment are located in each station. In the event of an emergency, employees should contact any supervisor or individual who is trained in first aid. Supervisors and employees trained in first aid will be visible by a first aid emblem on their clothing or jacket.

Fire

Fire is one of the most hazardous situations encountered on a worksite/jobsite because of the potential for large losses. Prompt reaction to and rapid suppression of any fire is essential. Name of Company will develop a fire protection program for each worksite/jobsite. The program shall provide for effective firefighting equipment to be available without delay and designed to effectively meet all fire hazards as they occur. In addition each fire protection program shall require that:

- All firefighting equipment be conspicuously located and readily available at all times.
- All firefighting equipment be inspected and maintained in operating condition.
- All fire protection equipment be inspected no less than once monthly with documentation maintained for each piece of equipment inspected.
- Discharged extinguishers or damaged equipment be immediately removed from service and replaced with operable equipment.
- All supervisors and employees seek out potential fire hazards and coordinate their abatement as rapidly as possible.
- Each individual assigned safety responsibilities will receive the necessary training to properly recognize fire hazards, inspect and maintain fire extinguishers and the proper use of each.
- A trained and equipped firefighting brigade will be established, as warranted by the project, to assure adequate protection to life.

Evacuation

Some emergencies may require company personnel to evacuate the worksite/ jobsite. In the event of an emergency that requires evacuation from the workplace, all employees are required to go to the area adjacent to the project that has been designated as the “safe area.” The safe area for this project is located: Description of location.

APPENDIX B

SUMMARY OF 29 CFR 1910

APPENDIX B

SUMMARY OF 29 CFR 1910

In this appendix you will find a summation of the General Industry standards entitled 29 CFR 1910, but only the ones that are most likely to apply to office buildings. There is a paragraph that highlights the content of each subpart of this standard. You will also find a listing of the sections that are contained within each subpart. Also, a checklist is included for each subpart. If you answer “Yes” to any question, then some or all of the subpart would be applicable to your operation. Thus, a yes answer suggests that your workplace needs to be in compliance with the applicable sections of that subpart. NOTE: Keep in mind that this summary and checklist include regulations that may or may not apply to every building employer or owner (e.g., employer who rents and has no maintenance workers).

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

SUBPART D—WALKING-WORKING SURFACES

This subpart addresses the requirements for maintaining walking and working surfaces. Subpart D applies to all permanent places of employment. It contains regulations pertaining to housekeeping, aisles and passageways, guarding wall and floor openings, fixed stairs, portable wood and metal ladders, fixed ladders, scaffolding, and manually propelled mobile ladder stands and scaffolds from frame to suspended types as well as dockboards.

Checklist:

- ☐ Do you use dockboards?
- ☐ Is attention paid to housekeeping?
- ☐ Are there floor and wall openings or holes at your facility?
- ☐ Do you have manually propelled mobile ladder stands and scaffolds?
- ☐ Do your workers use scaffolds in the performance of their work?
- ☐ Do you own scaffolds?
- ☐ Do you enforce housekeeping?
- ☐ Do you erect, tear down, or maintain scaffolds?
- ☐ Are you responsible for training workers regarding scaffolds and their safety?

- _____ Are scaffolds on your worksite?
- _____ Do your workers use ladders in performing their work?
- _____ Are your workers required to ascend and descend industrial stairs?
- _____ Does your company own ladders?
- _____ Do your workers have to climb fixed ladders?

Subpart D Regulations Sections:

- 1910.21 Definitions.
- 1910.22 General requirements.
- 1910.23 Guarding floor and wall openings and holes.
- 1910.24 Fixed industrial stairs.
- 1910.25 Portable wood ladders.
- 1910.26 Portable metal ladders.
- 1910.27 Fixed ladders.
- 1910.28 Safety requirements for scaffolding.
- 1910.29 Manually propelled mobile ladder stands and scaffolds (towers).
- 1910.30 Other working surfaces.

SUBPART E—MEANS OF EGRESS

This subpart deals specifically with providing a safe continuous and unobstructed means of egress to assure an open travel-way from any point in a building or structure to a safe exit. The standard addresses exits by describing the make up of an exit, specific physical requirements for an exit, and the number of exits required. This subpart also contains the requirements essential to providing a safe means of egress from fire and similar emergencies. The subpart sets forth the requirements for employee emergency plans and fire prevention plans. Emergency action and fire prevention plans are required that can ensure adequate escape procedures, evacuation routes, alarm systems, and other emergency actions.

Checklist:

- _____ Do you have an emergency action or escape plan or procedure?
- _____ Do you have a fire prevention plan for your facility?
- _____ Are all exits unlocked and free from impediments?
- _____ Is there a safe means of egress for all your workers?
- _____ Are all exits designed to be visible and allow for a safe egress from your facility?

Subpart E Regulations Sections:

1910.35 Definitions.

1910.36 General requirements.

1910.37 Means of egress, general.

1910.38 Employee emergency plans and fire prevention plans.

APPENDIX TO SUBPART E—MEANS OF EGRESS**SUBPART F—POWERED PLATFORMS, MANLIFTS, AND VEHICLE-MOUNTED WORK PLATFORMS**

This subpart covers powered platform installations permanently dedicated to interior or exterior building maintenance of a specific structure or group of structures. It does not apply to suspended self-powered platforms used to service buildings as well as the guidelines for personal fall-arrest systems. This subpart applies to all permanent installations completed after July 23, 1990 and contains information on powered platforms for building maintenance. Building maintenance covers a wide array of activities from window cleaning to engineering design of equipment as well as expressing the need to train workers. In addition, this section specifically addresses the requirements for vehicle-mounted elevating and rotating work platforms.

Checklist:

- _____ Do you provide fall protection for your workforce?
- _____ Are powered platforms used for building maintenance?
- _____ Do you have vehicle-mounted elevated and rotating work platforms?

Subpart F Regulations Sections:

1910.66 Powered platforms for building maintenance.

1910.67 Vehicle-mounted elevating and rotating work platforms.

SUBPART G—OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

The standards in subpart G deal with air quality, noise exposure exceeding 85 decibels, and nonionizing radiation exposure in the workplace.

Checklist:

- _____ Do you have noise exposure in excess of the 85dbA level?

- _____ Does your company use any chemicals that could be considered hazardous?
- _____ Does your company have a medical officer for examinations, advice, or consultation?
- _____ Have employees had injuries or illnesses that required first aid?
- _____ Have you had to do environmental or air monitoring?
- _____ Do you provide drinking water to workers?
- _____ Do you provide toilets and washing facilities?
- _____ Do you have sources of ionizing or nonionizing (lasers) radiation at your workplace?
- _____ Do you do contracting jobs where chemical processes involving highly hazardous chemicals take place?
- _____ Do you use some form of ventilation to remove airborne contaminants?

Subpart G Regulations Sections:

- 1910.94 Ventilation.
- 1910.95 Occupational noise exposure.
- 1910.97 Nonionizing radiation.

SUBPART H—HAZARDOUS MATERIALS

Subpart H contains information on compressed gases, acetylene, hydrogen, oxygen, nitrous oxide, flammable and combustible liquids or handling of liquid petroleum gasses, and storage and handling of anhydrous ammonia.

Checklist:

- _____ Do you use compressed gases?
- _____ Do you have acetylene, hydrogen, oxygen, or nitrous oxide on the premises?
- _____ Do handle, use, or store flammable or combustible liquids?

Subpart H Regulations Sections:

- 1910.101 Compressed gases (general requirements).
- 1910.102 Acetylene.
- 1910.103 Hydrogen.
- 1910.104 Oxygen.
- 1910.105 Nitrous oxide.
- 1910.106 Flammable and combustible liquids.
- 1910.110 Storage and handling of liquified petroleum gases.
- 1910.111 Storage and handling of anhydrous ammonia.

SUBPART I—PERSONAL PROTECTIVE EQUIPMENT

Subpart I requires employers to provide employees with the proper personal protective equipment (PPE) for the work being performed. As part of this requirement, the employer must conduct a hazard survey of the work to determine the control measures to use where hazards cannot be eliminated.

This serves as a resource in guiding the selection of the appropriate PPE. This includes PPE for eyes, face, head, and extremities. Other types of equipment that may be required are protective clothing and equipment as well as respiratory devices. All PPE is to be maintained and in a sanitary condition.

Not only are employers required to provide needed PPE, but they are required to train workers how to use and wear their PPE. Equipment for emergency use should be stored and accessible in a location known to all workers. The requirements for respirators and their use is the most extensive part of the subpart.

This subpart provides the standard for quality as well as selection of PPE such as eye/face protection, head protection, respiratory protection, foot protection, and hand/arm protection.

Checklist:

- _____ Do you require personal protective equipment to be used?
- _____ Do employees have the potential for falling, flying, or electrical hazards?
- _____ Do you require head protection?
- _____ Is there the opportunity for heavy material to fall onto the workers' feet?
- _____ Do you provide hand and arm protection, e.g., gloves?
- _____ Do your workers come into contact with electricity where they need protective equipment?
- _____ Do you have the potential at any time for workers to suffer eye injuries?
- _____ Do environment or air contaminants require the use of respirators?
- _____ Do your workers need eye and face protection?
- _____ Do your workers have the potential to be exposed to tuberculosis?

Subpart I Regulations Sections:

- 1910.132 General requirements.
- 1910.133 Eye and face protection.
- 1910.134 Respiratory protection.
- 1910.135 Head protection.
- 1910.136 Foot protection.
- 1910.137 Electrical protective devices.
- 1910.138 Hand protection.
- 1910.139 Respiratory protection for *M. tuberculosis*.

SUBPART J—GENERAL ENVIRONMENTAL CONTROLS

This section specifically applies to places of employment where such items as sanitary facilities, e.g., toilet facilities, washing facilities, sanitary food storage, and food handling. It also addresses temporary labor camps, safety colors for marking physical hazards, and requirements for accident prevention signs and tags. Two additional items specifically addressed by this section and of considerable importance are permit-required confined spaces and the control of hazardous energy (lockout/tagout).

Checklist:

- _____ Do you provide sanitary facilities for your workforce?
- _____ Do you have temporary labor camps?
- _____ Do you have warning or accident prevention signs or tags posted in your workplace?
- _____ Do you use the appropriate colors to mark physical hazards?
- _____ Do you have confined spaces in your workplace?
- _____ Does your workforce enter confined spaces where permits are needed?
- _____ Do you have a lockout/tagout program in place?
- _____ Do you require lockout/tagout procedures to be followed?

Subpart J Regulations Sections:

- 1910.141 Sanitation.
- 1910.142 Temporary labor camps.
- 1910.144 Safety color code for marking physical hazards.
- 1910.145 Specifications for accident prevention signs and tags.
- 1910.146 Permit-required confined spaces.
- 1910.147 The control of hazardous energy (lockout/tagout).

SUBPART K—MEDICAL AND FIRST AID

The purpose of medical and first aid is to provide the employee with readily available medical consultation. If medical personnel are not readily available then personnel adequately trained to administer first aid are to be present. These individuals should be provided protection and personal protective equipment to prevent exposure to blood-borne pathogens. The employer is required to provide fully equipped first aid kits and they are to be maintained and in suitable numbers to meet the needs of the workforce.

Checklist:

- _____ Is there qualified medical personnel at the facility?
- _____ Do you have personnel trained in first aid available?
- _____ Do you have first aid kits available?
- _____ Do you keep first aid kits adequately stocked?

Subpart K Regulations Sections:

- 1910.151 Medical services and first aid.

SUBPART L—FIRE PROTECTION

Subpart L is concerned with fire protection and fire prevention. This subpart contains requirements for all portable extinguishers, fixed-fire suppression systems, fire detection systems, and alarm systems. It contains training requirements for the organization and personnel. In addition, this subpart establishes the requirements for the placement, use, maintenance, and testing of portable fire extinguishers provided for use by employees, as well as the requirements for all automatic sprinkler systems installed to meet a particular OSHA standard. Firefighting equipment is to be available and readily accessible. Workers are to be trained annually on the use of fire extinguishers. The fire detection system should be in a labeled specific location. Lastly, a unique alarm system must be established at the worksite that will alert employees to a fire.

Checklist:

- _____ Does your worksite have a fire hazard potential?
- _____ Do you have a fire prevention program?
- _____ Do you use fire extinguishers at your site?
- _____ Do you train workers in fire prevention and firefighting?
- _____ Do you have a fire detection system or fire alarm system?
- _____ Are your employees expected to fight fires?

Subpart L Regulations Sections:

- 1910.155 Scope, application and definitions applicable to this subpart.

PORTABLE FIRE SUPPRESSION EQUIPMENT

- 1910.157 Portable fire extinguishers.
- 1910.158 Standpipe and hose systems.

FIXED FIRE SUPPRESSION EQUIPMENT

- 1910.159 Automatic sprinkler systems.
- 1910.160 Fixed extinguishing systems, general.
- 1910.161 Fixed extinguishing systems, dry chemical.
- 1910.162 Fixed extinguishing systems, gaseous agent.
- 1910.163 Fixed extinguishing systems, water spray and foam.

OTHER FIRE PROTECTIVE SYSTEMS

- 1910.164 Fire detection systems.
- 1910.165 Employee alarm systems.

SUBPART M—COMPRESSED GAS AND COMPRESSED AIR EQUIPMENT

This subpart applies to compressed-air receivers and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. However, this section does not deal with the special problems created by using compressed air to convey materials, nor the problems created when work is performed in compressed-air environments such as in tunnels and caissons. This section is not intended to apply to compressed-air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

Checklist:

- _____ Do you use a compressed-air receiver?
- _____ Do you have equipment that provides compressed air?

Subpart M Regulations Sections:

- 1910.169 Air receivers.

SUBPART N—MATERIALS HANDLING AND STORAGE

Subpart N details the storage of materials and how to stack, rack, and secure them against falling or sliding. Materials should not create a hazard due to storage in aisles or passageways. Housekeeping is an important component of handling and storing of materials.

This subpart describes many common safety requirements for material handling equipment and reinforces the need to follow the manufacturer's requirements regarding load capacities, speed limits, special hazards, and unique equipment characteristics.

The industrial trucks section covers the classifications of trucks and designated areas where a truck can be used. It also describes the required inspections and

maintenance actions for those vehicles. Safe operation procedures are also covered in this section.

Checklist

- _____ Do you operate powered industrial trucks (forklifts) at your facility?
- _____ Do you have materials stored on the worksite?
- _____ Do you have waste materials on the jobsite?
- _____ Does your company have responsibility for housekeeping?

Subpart N Regulations Sections:

- 1910.176 Handling material—general.
- 1910.178 Powered industrial trucks.

SUBPART O—MACHINERY AND MACHINE GUARDING

Subpart O covers the machine guarding for any equipment that exposes employees to a hazard during use due to exposed moving or rotating parts; generally speaking, this covers any device that has an exposed point of operation

Checklist:

- _____ Do you have equipment that poses a hazard and needs guards?

Subpart O Regulations Sections:

- 1910.211 Definitions.
- 1910.212 General requirements for all machines.

SUBPART P—HAND AND PORTABLE POWERED TOOLS AND OTHER HAND-HELD EQUIPMENT.

The Subpart P regulation is dedicated to the safe use of both power and hand tools, including employer and employee owned tools. The subpart requires that hand tools be safe and free from defects. It also cautions against misuse of tools.

This subpart addresses the need for properly guarded power tools. It discusses the areas where guarding is required and the types of guards that should be used, as well as the proper protective equipment to be used when tools create such hazards as flying materials. The power tools that are covered by the regulation include electrical, pneumatic, or fuel. These tools are to be secured if maintained in a fixed place and all electrically powered equipment must be effectively grounded. It also pertains to riding and walk-behind lawn mowers and other internal-combustion-engine-powered machines.

Checklist:

- _____ Do your workers use hand or power tools?
- _____ Do your workers use woodworking tools?
- _____ Do your workers use abrasive wheels or tools?
- _____ Do you supply tools to workers?
- _____ Do your workers use walk-behind or riding mowers?

Subpart P Regulations Sections:

- 1910.241 Definitions.
- 1910.242 Hand and portable powered tools and equipment, general.
- 1910.243 Guarding of portable powered tools.
- 1910.244 Other portable tools and equipment.

SUBPART Q—WELDING, CUTTING, AND BRAZING

Subpart Q covers the use and installation of arc or gas welding, cutting, and brazing equipment. It covers the different types of welding and ties specific safety needs of each. This subpart also regulates the use of oxygen-fuel gas welding and cutting, arc welding and cutting, and resistance welding. Subpart Q covers the procedures and precautions associated with gas welding, cutting, arc welding, fire prevention, compressed gas cylinders, and welding materials. Special attention is given to the transporting, moving, and storing of compressed gas cylinders, as well as the apparatuses such as hoses, torches, and regulators used for welding. Defective gas cylinders should not be used. All cylinders should be marked and labeled with one-inch letters. Hoses should be identifiable and designed such that they cannot be misconnected to the wrong cylinder regulators. Prework inspections are an important component of this subpart.

Arc welding and its unique precautions are covered by this regulation. This includes grounding, care of cables, and care of electrode holders. As with all welding and cutting operations, appropriate personal protective equipment and safety is addressed in this subpart.

Fire prevention is an important part of welding and cutting, and such work is not to be performed near flammable vapors, fumes, or heavy dust concentrations. Firefighting equipment must be readily accessible and in good working order.

Checklist:

- _____ Do your workers perform welding and cutting tasks?
- _____ Do you have compressed gas cylinders on your jobsite?
- _____ Do you have adequate firefighting equipment?
- _____ Is there a need for ventilation?
- _____ Do your welders wear personal protective equipment?

- _____ Does your company weld or cut in confined spaces?
- _____ Do your workers have to weld or cut on toxic materials?

Subpart Q Regulations Sections:

- 1910.251 Definitions.
- 1910.252 General requirements.
- 1910.253 Oxygen-fuel gas welding and cutting.
- 1910.254 Arc welding and cutting.

SUBPART S—ELECTRICAL

Subpart S relates to the installation and use of electrical power on worksites, including both permanent and temporary. The two areas of emphasis within this subpart are installation safety requirements and safety related work practices.

Installation safety requirements sections of subpart S require that all electrical parts be inspected for durability, quality, and appropriateness. Installation that follows the National Electric Code is considered in compliance with OSHA. Grounding is an important part of this regulation and the use of GFCIs or assured grounding is required. Emphasis is placed upon temporary and portable lighting, as well as the use of extension cords. All listed, labeled, and certified equipment must be installed according to instructions from the manufacturer. This subpart includes special purpose equipment installation such as cranes and monorail hoist, electric welders, and x-ray equipment. It discusses work in high hazard locations as well as special systems such as remote control and power-limited circuits.

Safety related work practices include workers not working on energized circuits, including precautions for working on hidden underground power sources. This subpart addresses the use of barriers to protect workers from electrical sources. Also, working around electrically energized equipment and power lines is explained as well as the procedures for lockout/tagout of energized circuits to protect workers.

The primary purpose of this subpart is to protect workers from coming into contact with energized electrical power sources.

Checklist:

- _____ Do you employ electricians?
- _____ Do your employees perform electrical installations?
- _____ Do your workers work around energized electrical circuits?
- _____ Do you follow a lockout/tagout procedure?
- _____ Do you use temporary lighting and extension cords?
- _____ Do your workers use GFCIs?
- _____ Do you have workers working in hazardous environments?
- _____ Do your workers use electrically powered tools?

- _____ Are there energized power lines on your jobsite?
- _____ Do your workers work around energized power lines?
- _____ Is there special electrically powered equipment on your worksite?

Subpart S Regulations Sections:

GENERAL

1910.301 Introduction.

DESIGN SAFETY STANDARDS FOR ELECTRICAL SYSTEMS

- 1910.302 Electric utilization systems.
- 1910.303 General requirements.
- 1910.304 Wiring design and protection.
- 1910.305 Wiring methods, components, and equipment for general use.
- 1910.306 Specific purpose equipment and installations.
- 1910.307 Hazardous (classified) locations.
- 1910.308 Special systems.
- 1910.309-1910.330 [Reserved]

SAFETY-RELATED WORK PRACTICES

- 1910.331 Scope.
- 1910.332 Training.
- 1910.333 Selection and use of work practices.
- 1910.334 Use of equipment.
- 1910.335 Safeguards for personnel protection.
- 1910.336-1910.360 [Reserved].

SUBPART Z—TOXIC AND HAZARDOUS SUBSTANCES

Subpart Z provides specific regulations for a select group of toxic or hazardous chemicals. The regulations set specific exposure limits, detail acceptable work procedures, delineate workplace /environmental sampling requirements, set specific personal protective equipment requirements, and denotes the need for regulated work areas. This subpart also has the Permissible Exposure Limits (PELs) for more than 500 hazardous chemicals. Subpart Z discusses, in some detail, working with and around potential cancer-causing chemicals. For many of the chemicals unique training requirements exist, as well as medical monitoring and surveillance. Requirements exist for posting and labels that warn of the dangers from exposure to specific chemicals. In many cases precise decontamination is required, along with hygiene procedures to minimize potential contamination to workers or the spread of contamination. These regulations communicate

the hazards involved and discuss the target organs, signs, and symptoms that accompany an occupational illness from one of these hazardous or toxic chemicals.

Because each of these chemicals has unique properties, adverse effects, handling procedures, signs and symptoms of overexposure, and regulatory requirements, the regulation specific to each chemical must be consulted and complied with.

This subpart also covers hazard communication, blood-borne pathogens, ionizing radiation, placarding and laboratories chemical safety.

Checklist:

- _____ Does your company use any of the chemicals listed in sections 1000 through 1052?
- _____ Do any of the chemical mixtures that you use on your jobsites contain any chemicals in sections 1000 through 1052?
- _____ Do you have any sources of ionizing radiation?
- _____ Do other contractors use any of the chemicals in sections 1000 through 1052 that might expose your own workers inadvertently?
- _____ Do you have a hazard communication program?
- _____ Do you provide training to your workers on any of the chemicals listed in section 1000 through 1052?
- _____ Does any of your work take your workers onto or into worksites where exposure to any of the chemicals in 1000 through 1052 could occur?
- _____ Do you have laboratories where hazardous chemicals exist or are used?

Subpart Z Regulations Sections:

- 1910.1000 Air contaminants.
- 1910.1001 Asbestos.
- 1910.1002 Coal tar pitch volatiles; interpretation of term.
- 1910.1003 13 Carcinogens (4-Nitrobiphenyl, etc.).
- 1910.1004 alpha-Naphthylamine.
- 1910.1006 Methyl chloromethyl ether.
- 1910.1007 3,3'-Dichlorobenzidine (and its salts).
- 1910.1008 bis-Chloromethyl ether.
- 1910.1009 beta-Naphthylamine.
- 1910.1010 Benzidine.
- 1910.1011 4-Aminodiphenyl.
- 1910.1012 Ethyleneimine.
- 1910.1013 beta-Propiolactone.
- 1910.1014 2-Acetylaminofluorene.
- 1910.1015 4-Dimethylaminoazobenzene.

- 1910.1016 N-Nitrosodimethylamine.
- 1910.1017 Vinyl chloride.
- 1910.1018 Inorganic arsenic.
- 1910.1020 Access to employee exposure and medical records.
- 1910.1025 Lead.
- 1910.1027 Cadmium.
- 1910.1028 Benzene.
- 1910.1029 Coke oven emissions.
- 1910.1030 Blood-borne pathogens.
- 1910.1043 Cotton dust.
- 1910.1044 1,2-dibromo-3-chloropropane.
- 1910.1045 Acrylonitrile.
- 1910.1047 Ethylene oxide.
- 1910.1048 Formaldehyde.
- 1910.1050 Methylenedianiline.
- 1910.1051 1,3-Butadiene.
- 1910.1052 Methylene Chloride.
- 1910.1096 Ionizing radiation.
- 1910.1200 Hazard communication.
- 1910.1201 Retention of DOT markings, placards and labels.
- 1910.1450 Occupational exposure to hazardous chemicals in laboratories.

APPENDIX C

**FEDERAL OSHA REGIONAL
AND
STATE OSHA OFFICES**

APPENDIX C

**FEDERAL OSHA REGIONAL
AND
STATE OSHA OFFICES**

Region I: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

1 Dock Square Building, 4th Floor
16-18 North Street
Boston, Massachusetts 02109
Phone: (617) 223-6710

Region II: New Jersey, New York, Puerto Rico, Virgin Islands

1515 Broadway, Room 3445
New York, New York 10036
Phone: (212) 944-3437

Region III: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia

Gateway Building, Suite 2100
3535 Market Street
Philadelphia, Pennsylvania 19104
Phone: (215) 596-1201

Region IV: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

1375 Peachtree St. N.E., Suite 587
Atlanta, Georgia 30367
Phone: (404) 347-3573

Region V: Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

230 South Dearborn Street, Rm. 3244
Chicago, Illinois 60604
Phone: (312) 353-2220

Region VI: Arkansas, Louisiana, New Mexico, Oklahoma, Texas

525 Griffin Square Bldg., Rm. 602
Dallas, Texas 75202
Phone: (214) 767-4731

Region VII: Iowa, Kansas, Missouri, Nebraska

911 Walnut Street, Room 406
Kansas City, Missouri 64106
Phone: (816) 374-5861

Region VIII: Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
Federal Building, Room 1554
1961 Stout Street
Denver, Colorado 80294
Phone: (303) 837-3061

Region IX: Arizona, California, Hawaii, Nevada, American Samoa, Guam, Trust
Territory of the Pacific Islands
450 Golden Gate Ave., Box 36017
San Francisco, California 94102
Phone: (415) 556-7260

Region X: Alaska, Idaho, Oregon, Washington
Federal Office Building, Room 6003
909 First Avenue
Seattle, Washington 98174
Phone: (206) 442-5930

STATE PLAN OFFICES

Alaska:

Alaska Department of Labor and Workforce Development
P.O. Box 21149
1111 W. 8th Street, Room 306
Juneau, Alaska 99802-1149
(907) 269-4904 Fax: (907) 269-4915

Arizona:

Industrial Commission of Arizona
800 W. Washington
Phoenix, Arizona 85007-2922
(602) 542-5795 Fax: (602) 542-1614

California:

California Department of Industrial Relations
455 Golden Gate Avenue - 10th Floor
San Francisco, California 94102
(415) 703-5050 Fax: (415) 703-5114

Connecticut:

Connecticut Department of Labor
Conn-OSHA
38 Wolcott Hill Road
Wethersfield, Connecticut 06109
(860) 566-4550 Fax: (860) 566-6916

Hawaii:

Hawaii Department of Labor and Industrial Relations
830 Punchbowl Street
Honolulu, Hawaii 96813
(808) 586-8844 Fax: (808) 586-9099

Indiana:

Indiana Department of Labor
State Office Building
402 West Washington Street, Room W195
Indianapolis, Indiana 46204-2751
(317) 232-2378 Fax: (317) 233-3790

Iowa:

Iowa Division of Labor
1000 E. Grand Avenue
Des Moines, Iowa 50319-0209
(515) 242-5870 Fax: (515) 281-7995

Kentucky:

Kentucky Labor Cabinet
1047 U.S. Highway 127 South, Suite 4
Frankfort, Kentucky 40601
(502) 564-3070 ext. 240 Fax: (502) 564-1682

Maryland:

Maryland Division of Labor and Industry
Department of Labor, Licensing and Regulation
1100 North Eutaw Street, Room 613
Baltimore, Maryland 21201-2206
(410) 767-2241 Fax: (410) 767-2986

Michigan:

Michigan Department of Consumer and Industry Services
Bureau of Safety and Regulation
P.O. Box 30643
Lansing, MI 48909-8143
(517) 322-1814 Fax: (517) 322-1775

Minnesota:

Minnesota Department of Labor and Industry
443 Lafayette Road
St. Paul, Minnesota 55155
(651) 282-5772 Fax: (651) 297-2527

Nevada:

Nevada Division of Industrial Relations
400 West King Street, Suite 400
Carson City, Nevada 89703
(775) 687-3032 Fax: (775) 687-6305

New Jersey:

New Jersey Department of Labor
John Fitch Plaza - Labor Building
Market and Warren Streets
P.O. Box 110
Trenton, New Jersey 08625-0110
(609) 292-2975 Fax: (609) 633-9271

New Mexico:

New Mexico Environment Department
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-4230 Fax: (505) 827-4422

New York:

New York Department of Labor
W. Averell Harriman State Office Building-12, Room 500
Albany, NY 12240
(518) 457-3518 Fax: (518) 457-1519

North Carolina:

North Carolina Department of Labor
4 West Edenton Street
Raleigh, North Carolina 27601-1092
(919) 807-2900 Fax: (919) 807-2855

Oregon:

Oregon Occupational Safety and Health Division
Department of Consumer & Business Services
350 Winter Street, NE, Room 430
Salem, Oregon 97310-0220
(503) 378-3272 Fax: (503) 947-7461

Puerto Rico:

Puerto Rico Department of Labor and Human Resources
Prudencio Rivera Martinez Building
505 Muñoz Rivera Avenue
Hato Rey, Puerto Rico 00918
(787) 756-1100, 1106 / 754-2171 Fax: (787) 767-6051

South Carolina:

South Carolina Department of Labor, Licensing, and Regulation
Koger Office Park, Kingstree Building
110 Centerview Drive
PO Box 11329
Columbia, South Carolina 29211
(803) 896-4300 Fax: (803) 896-4393

Tennessee:

Tennessee Department of Labor
710 James Robertson Parkway
Nashville, Tennessee 37243-0659
(615) 741-2793 Fax: (615) 741-3325

Utah:

Utah Labor Commission
160 East 300 South, 3rd Floor
PO Box 146650
Salt Lake City, Utah 84114-6650
(801) 530-6898 Fax: (801) 530-6390

Vermont:

Vermont Department of Labor and Industry
National Life Building - Drawer 20
Montpelier, Vermont 05620-3401
(802) 828-2288 Fax: (802) 828-2748

Virgin Islands:

Virgin Islands Department of Labor
2203 Church Street
Christiansted, St. Croix, Virgin Islands 00820-4660
(340) 773-1994 Fax: (340) 773-1858

Virginia:

Virginia Department of Labor and Industry
Powers-Taylor Building
13 South 13th Street
Richmond, Virginia 23219
(804) 786-2377 Fax: (804) 371-6524

Washington:

Washington Department of Labor and Industries
General Administration Building
PO Box 44001
Olympia, Washington 98504-4001
(360) 902-4200 Fax: (360) 902-4202

Wyoming:

Wyoming Department of Employment
Workers' Safety and Compensation Division
Herschler Building, 2nd Floor East
22 West 25th Street
Cheyenne, Wyoming 82002
(307) 777-7786 Fax: (307) 777-3646

APPENDIX D

COMPREHENSIVE OFFICE BUILDING SAFETY AND HEALTH INSPECTION CHECKLIST

APPENDIX D

COMPREHENSIVE OFFICE BUILDING SAFETY AND HEALTH INSPECTION CHECKLIST

Use this inspection checklist to evaluate an office building related to safety and health. Feel free to alter or add to this list to tailor it to your specific office building.

Workplace inspections are a way of identifying hazards in the workplace. Inspections also provide a system to monitor whether hazards have been fixed. All facilities and office areas should conduct workplace inspections at least twice a year. If difficulties are noted, inspections should be conducted more often.

Building

- ☐ Yes ☐ No Does the office building conform to the standards with respect to use, occupancy, building services, and plumbing facilities?
- ☐ Yes ☐ No Are doors built to ensure safety?
- ☐ Yes ☐ No Are floor and wall openings built to ensure safety?
- ☐ Yes ☐ No Are ladder, stairways, and ramps built to ensure safety?
- ☐ Yes ☐ No Are guardrails built to ensure safety?

Housekeeping

- ☐ Yes ☐ No Is time allotted to perform daily housekeeping duties?
- ☐ Yes ☐ No Is standard cleaning adequate?
- ☐ Yes ☐ No Are all work areas clean, sanitary, and orderly?
- ☐ Yes ☐ No Are tile floors in places like kitchens and restrooms free of water and slippery substances?
- ☐ Yes ☐ No Are all cabinets located so as not to protrude into walkways?
- ☐ Yes ☐ No Is storage of material/equipment on top of cabinets discouraged or kept to a minimum?
- ☐ Yes ☐ No Are filing cabinets anchored or interlocked (only one drawer opens at a time)?

- ☐ Yes ☐ No Are sufficient bins provided for rubbish and are they emptied regularly?
- ☐ Yes ☐ No Are all office areas cleaned regularly?
- ☐ Yes ☐ No Are coffee makers, ovens and hot plates securely fixed to avoid risk of scalds?
- ☐ Yes ☐ No Are passageways kept free from obstructions?
- ☐ Yes ☐ No Is the floor space clear of objects and debris?
- ☐ Yes ☐ No Are the work areas clear of electrical cords or network cables?
- ☐ Yes ☐ No Are waste paper bins free of hazardous materials such as broken glass?
- ☐ Yes ☐ No Are floor coverings in good condition?
- ☐ Yes ☐ No Are computer/desk areas clear of cups/glasses/food items?

Hygiene

- ☐ Yes ☐ No Are all floors clean?
- ☐ Yes ☐ No Are desks/worktops intact and easily cleaned?
- ☐ Yes ☐ No Are washrooms and food preparation areas clean?
- ☐ Yes ☐ No Is there a potable drinking water supply?
- ☐ Yes ☐ No Are there adequate hand washing facilities?
- ☐ Yes ☐ No Is there an adequate supply of soap and towels in restrooms and locker rooms?
- ☐ Yes ☐ No Are personal items, such as clothing and lunch boxes, kept in assigned locker or storage areas?

Toilets

- ☐ Yes ☐ No Are toilets cleaned satisfactorily?
- ☐ Yes ☐ No Are toilet pans cracked?
- ☐ Yes ☐ No Are hand basins cracked?
- ☐ Yes ☐ No Are toilet seats intact?
- ☐ Yes ☐ No Are tiles intact?
- ☐ Yes ☐ No Are urinals clean?
- ☐ Yes ☐ No Is the sanitary disposal adequate and collected regularly?
- ☐ Yes ☐ No Do floors have non-slip surface?
- ☐ Yes ☐ No Is the ventilation adequate?

Spill Control

- ☐ Yes ☐ No Are spills wiped up quickly?
- ☐ Yes ☐ No Are procedures followed as indicated on the MSDS?
- ☐ Yes ☐ No Are spill absorbents used for greasy, oily, flammable, or toxic materials?
- ☐ Yes ☐ No Are used rags and absorbents disposed of promptly and safely?
- ☐ Yes ☐ No Is a spill area surrounded by a barrier to prevent a spill from spreading?

Waste Disposal

- ☐ Yes ☐ No Are all waste containers easily located?
- ☐ Yes ☐ No Are waste bins routinely emptied?
- ☐ Yes ☐ No Are recyclable material collection areas located in a safe area and maintained neatly and orderly?
- ☐ Yes ☐ No Are waste containers in the offices made of noncombustible or approved materials?
- ☐ Yes ☐ No Do personnel carefully handle and properly dispose of hazardous materials such as broken glass, and are housekeeping staff advised of the location and content of such materials?

Flooring and Walking Surfaces

- ☐ Yes ☐ No Do floors have even surfaces (no cracks or holes)?
- ☐ Yes ☐ No Is the floor covered with suitable surface or carpet?
- ☐ Yes ☐ No Do the floors use non-slip materials?
- ☐ Yes ☐ No Are carpets free from fraying or loose edges?
- ☐ Yes ☐ No Are mats in place for wiping feet?
- ☐ Yes ☐ No Are floors and aisles clear of rubbish, materials and equipment?
- ☐ Yes ☐ No Do walkways have electrical cords lying across them?
- ☐ Yes ☐ No Are “wet floor” signs used when required?

Stairs, Corridors, Landings, and Aisles

- ☐ Yes ☐ No Do stairs have no worn or broken treads?
- ☐ Yes ☐ No Are handrails in good repair?
- ☐ Yes ☐ No Are non-skid strips on stairs in good condition?

- ☐ Yes ☐ No Do stair landings have kick plates?
- ☐ Yes ☐ No Are emergency exit stairs adequately lit?
- ☐ Yes ☐ No Are mirrors installed at blind corners?

Doors and Windows

- ☐ Yes ☐ No Are door handles and catches in good repair?
- ☐ Yes ☐ No Do large glass doors have accident prevention warnings on them?
- ☐ Yes ☐ No Do glass doors have a push/pull plate for safe operations?
- ☐ Yes ☐ No Are outside doors fitted with weather seals where necessary?
- ☐ Yes ☐ No Is damaged door glass replaced with safety glass?
- ☐ Yes ☐ No Are doorways suitable for wheelchair access?
- ☐ Yes ☐ No Where windows need to be opened, can this be done with ease?

Storage

- ☐ Yes ☐ No Are storage areas safe and accessible?
- ☐ Yes ☐ No Are materials stored in areas that do not interfere with workers and the flow of materials?
- ☐ Yes ☐ No Are storage areas clearly marked?
- ☐ Yes ☐ No Are materials stored on shelves or in storage rooms as appropriate?
- ☐ Yes ☐ No Are heavy items not stored up high?
- ☐ Yes ☐ No Are storage shelves free from rubbish?
- ☐ Yes ☐ No Are storage rooms neat and tidy?
- ☐ Yes ☐ No Are stored materials secured to prevent shifting/falling?
- ☐ Yes ☐ No Are bins or racks provided where material cannot be piled?
- ☐ Yes ☐ No Is there sufficient storage space?
- ☐ Yes ☐ No Are shelves/bookshelves in use and secured to ensure stability?
- ☐ Yes ☐ No Are suitable containers used for storage?
- ☐ Yes ☐ No Do workers understand material storage and handling procedures?

Manual Material Handling

- ☐ Yes ☐ No Have staff received training in material handling?
- ☐ Yes ☐ No Are there objects that require pushing, pulling, lifting, lowering, carrying, holding, moving, and do these actions require considerable physical effort or force to complete?
- ☐ Yes ☐ No Are no large, awkward or heavy objects handled?

- ☐ Yes ☐ No Are heavy or awkward objects handled more than once every 5 minutes?
- ☐ Yes ☐ No Is handling required more than 5 times per hour over a day?
- ☐ Yes ☐ No Is handling performed below waist height and not above shoulder height?
- ☐ Yes ☐ No Are team-lifting techniques used when shifting furniture?
- ☐ Yes ☐ No Are hand trucks or dollies used when necessary?
- ☐ Yes ☐ No Are ladder and moving stairways available to access high shelving/storage space?

Lifting Techniques

- ☐ Yes ☐ No Have all staff who routinely lift/push/pull loads been trained in the correct lifting techniques?
- ☐ Yes ☐ No Are heavy items stored at an appropriate height for ease of lifting and handling?
- ☐ Yes ☐ No Are workers encouraged to use good lifting techniques?

Forklifts

- ☐ Yes ☐ No Are brakes, steering, lights, and warning devices in good repair on lift trucks?
- ☐ Yes ☐ No Are lift truck operators trained and is training documented?
- ☐ Yes ☐ No Are pre- and post-use inspections conducted on forklifts?

Loading Docks

- ☐ Yes ☐ No Are safe loading practices used with hand and power trucks, skids and pallets?
- ☐ Yes ☐ No Are loading docks adequately striped?
- ☐ Yes ☐ No Are the wheels of trailers chocked during loading and unloading operations?

Ergonomics/Work Practices

- ☐ Yes ☐ No Is there unnecessary or excessive bending or stooping?
- ☐ Yes ☐ No Are desks and chairs suitable for the required tasks?
- ☐ Yes ☐ No Can the user get close to the workstation without impediment?
- ☐ Yes ☐ No Has every office worker completed an ergonomic self assessment?
- ☐ Yes ☐ No Are work surfaces (desks, benches) set up at the appropriate height?

- ☐ Yes ☐ No Is work oriented for easy access to phones, computer, or shelves?
- ☐ Yes ☐ No Do routine tasks require individuals to lift excessive weight?
- ☐ Yes ☐ No Is adjustable seating available when appropriate?
- ☐ Yes ☐ No Is a footrest available for those who need it?
- ☐ Yes ☐ No Has each job been designed to provide a variety of tasks throughout the day in terms of physical and mental workload?
- ☐ Yes ☐ No Is there rotation from repetitive work?
- ☐ Yes ☐ No Are adequate rest breaks provided?
- ☐ Yes ☐ No Is lockout/tagout used to prevent the errant release of energy?

VDT Ergonomics

- ☐ Yes ☐ No Are all chairs in use at VDT stations fully adjustable (height, backrest, armrest, etc.)?
- ☐ Yes ☐ No Does office staff take regular breaks from VDT work (5 minutes each hour)?
- ☐ Yes ☐ No Is there adequate space underneath desks to swivel knees 90 degrees in each direction?
- ☐ Yes ☐ No Are windows fitted with blinds to eliminate glare?
- ☐ Yes ☐ No Are headsets provided to workers who spend extended time on the phone?
- ☐ Yes ☐ No Do all staff know how to adjust their chairs and arrange their workstations?

Furniture

- ☐ Yes ☐ No Is existing furniture adequate for the task?
- ☐ Yes ☐ No Is existing furniture in good order?
- ☐ Yes ☐ No Are chairs, files, bookcases, and desks replaced or repaired if they become damaged?
- ☐ Yes ☐ No Is relevant furniture properly adjusted?
- ☐ Yes ☐ No Has consideration been given to appropriate ergonomics?
- ☐ Yes ☐ No Are cubicle walls overloaded?
- ☐ Yes ☐ No Is furniture free of any unsafe defects?
- ☐ Yes ☐ No Are all furnishings arranged to provide clear access to exits?

Emergencies and Evacuations

- ☐ Yes ☐ No Is emergency information clearly posted?
- ☐ Yes ☐ No Are emergency telephone numbers readily available?
- ☐ Yes ☐ No Are access and egress points readily accessible?
- ☐ Yes ☐ No Is emergency exit signage adequate?
- ☐ Yes ☐ No Are emergency evacuation procedures clearly display?

Exits

- ☐ Yes ☐ No Are exit doors clearly marked?
- ☐ Yes ☐ No Are exit corridors clear of obstructions?
- ☐ Yes ☐ No Are exit ladders and catwalks clear of obstructions?
- ☐ Yes ☐ No Are combustible materials never allowed to be stored in stairwells?
- ☐ Yes ☐ No Can exit doors be easily opened from inside without the use of a key?

Warning Signs

- ☐ Yes ☐ No Are information signs and Braille used to convey information to workers and visitors?
- ☐ Yes ☐ No Are appropriate warning and safety signs used effectively?
- ☐ Yes ☐ No Are warning signs regarding electrical hazards posted?
- ☐ Yes ☐ No Are warning signs regarding confined spaces posted?

Fires

- ☐ Yes ☐ No Are fire wardens appointed for each floor of the building?
- ☐ Yes ☐ No Have fire wardens been trained in respect to their duties?
- ☐ Yes ☐ No Are fire alarm pull stations clearly marked and unobstructed?
- ☐ Yes ☐ No Are fire exits and escape routes checked regularly by fire wardens?
- ☐ Yes ☐ No Is a fire drill conducted at least annually?
- ☐ Yes ☐ No Do all personnel know where fire extinguishers are located — has a large proportion of the staff been trained in their use?
- ☐ Yes ☐ No Is heat-producing equipment used in a well-ventilated area?
- ☐ Yes ☐ No Are all flammable materials stored securely in appropriate locations?

- ☐ Yes ☐ No Are possible ignition sources, e.g., electrical heaters, securely located?
- ☐ Yes ☐ No Has all staff been trained in alternative escape routes?
- ☐ Yes ☐ No Are escape routes marked?
- ☐ Yes ☐ No Are evacuation maps posted?

Fire Extinguishers

- ☐ Yes ☐ No Is the relevant firefighting equipment readily available?
- ☐ Yes ☐ No Are fire extinguishers easily located?
- ☐ Yes ☐ No Are fire extinguishers inspected and tagged within the last six months?
- ☐ Yes ☐ No Are fire hoses conveniently located in major corridors?
- ☐ Yes ☐ No Are overhead sprinklers/detectors clear of obstructions and stored material?
- ☐ Yes ☐ No Are emergency instructions for fire extinguishers clearly displayed?
- ☐ Yes ☐ No Are spent fire extinguishers replaced and refilled by qualified providers?
- ☐ Yes ☐ No Are special procedures in place for disabled workers to alert them to the danger and, if needed, to assist them in exiting?
- ☐ Yes ☐ No Is every worker's area located adjacent to an aisle or subsidiary aisle?
- ☐ Yes ☐ No Are exits, circuit breakers, doors, and aisles free of obstructions?

First Aid

- ☐ Yes ☐ No Are first aid kits readily accessible?
- ☐ Yes ☐ No Are supplies maintained and adequate?
- ☐ Yes ☐ No Is there a separate first aid room at the workplace?
- ☐ Yes ☐ No Are first aid cabinets and contents clean and orderly?
- ☐ Yes ☐ No Is there easy access to first aid kits?
- ☐ Yes ☐ No Are first aid kits clearly labeled?
- ☐ Yes ☐ No Are emergency numbers clearly displayed?
- ☐ Yes ☐ No Are there adequate hand washing facilities?
- ☐ Yes ☐ No Are there eyewashes available as needed?
- ☐ Yes ☐ No Are chemical showers available when needed?
- ☐ Yes ☐ No Are there notices that indicate the location of each first aid kit on display?

- ☐ Yes ☐ No Does the workplace have fully trained first aid personnel?
- ☐ Yes ☐ No Are names and contact numbers for first aid qualified personnel clearly displayed?

Infectious Waste

- ☐ Yes ☐ No Do workers take precautions to prevent contact with infectious materials?
- ☐ Yes ☐ No Have workers been trained in accordance with the Bloodborne Pathogen Standard?

Environment

- ☐ Yes ☐ No Is there sufficient ventilation?
- ☐ Yes ☐ No Are lights working effectively?
- ☐ Yes ☐ No If air conditioning exists, is it working effectively?
- ☐ Yes ☐ No Are there any sources of excessive noise in the immediate work area or from external sources?
- ☐ Yes ☐ No Are temperature and humidity at acceptable levels?

Indoor Air Quality

- ☐ Yes ☐ No Is the air conditioning system maintained regularly?
- ☐ Yes ☐ No Does air exchange rate meet standard requirements?
- ☐ Yes ☐ No Is the HVAC system free of sources of contamination (asbestos, microorganisms, and dust)?
- ☐ Yes ☐ No Is humidity at standard levels?
- ☐ Yes ☐ No Does ventilation control smoke and fumes?
- ☐ Yes ☐ No Do staff suffer from dry, irritated eyes at the end of the day?
- ☐ Yes ☐ No Do the offices seem stuffy?
- ☐ Yes ☐ No Is temperature control satisfactory, e.g., not too hot, cold, or fluctuating?
- ☐ Yes ☐ No Are the heating and cooling systems working in a satisfactory manner?
- ☐ Yes ☐ No Where applicable, are ceiling fans adequately attached?

Lighting

- ☐ Yes ☐ No Is there adequate lighting for work undertaken?
- ☐ Yes ☐ No Are glare and reflections controlled to acceptable levels?

- ☐ Yes ☐ No Is area lighting steady (no flickering light)?
- ☐ Yes ☐ No Is emergency lighting available in rooms without windows?
- ☐ Yes ☐ No Are all lights functional?
- ☐ Yes ☐ No Are windows cleaned?

Noise

- ☐ Yes ☐ No Does noise level interfere with emergency signals?
- ☐ Yes ☐ No Is it difficult to hear a normal voice within a three-foot distance?
- ☐ Yes ☐ No Are there distracting or disruptive noises in the office area?
- ☐ Yes ☐ No Are staff aware of the effects of excessive noise exposure?
- ☐ Yes ☐ No Is appropriate Personal Protective Equipment (PPE) supplied?
- ☐ Yes ☐ No Do affected staff member wear hearing protection?

Hazardous Substances

- ☐ Yes ☐ No Are Material Safety Data Sheets available for hazardous substances (e.g., toner, cleaning products)?
- ☐ Yes ☐ No Are flammable liquids stored correctly?
- ☐ Yes ☐ No Whenever possible, do you keep the approved containers containing hazardous substances in either a storage cabinet or a storage room, with only small quantities on hand for daily use?
- ☐ Yes ☐ No Have all dangerous substances been identified?
- ☐ Yes ☐ No Are there any chemical, physical, or biological hazards in the office building?
- ☐ Yes ☐ No Are combustible and flammable materials kept in safety cans during use?
- ☐ Yes ☐ No Are hazardous materials stored in approved containers and away from ignition sources?
- ☐ Yes ☐ No Are all containers properly labeled?
- ☐ Yes ☐ No Have all exposed employees been trained in hazard communications?
- ☐ Yes ☐ No Are eyewash stations located in appropriate areas, kept full, clean, and accessible?
- ☐ Yes ☐ No Are oily or greasy rags placed in metal containers and disposed of regularly?

Electrical

- ☐ Yes ☐ No Are there broken plugs, sockets or switches?

- ☐ Yes ☐ No Does non-fixed electrical equipment have a current tag?
- ☐ Yes ☐ No Are electrical repairs carried out by trained and competent personnel only?
- ☐ Yes ☐ No Are no temporary or makeshift leads/power boards in use?
- ☐ Yes ☐ No Are high-voltage electrical service rooms kept locked?
- ☐ Yes ☐ No Are power strips plugged directly into an outlet and not into another power strip?
- ☐ Yes ☐ No Are extension cords used for temporary wiring and only for low-wattage items?
- ☐ Yes ☐ No Are electrical cover plates in good repair or not missing?
- ☐ Yes ☐ No Is faulty or misused equipment removed from service?
- ☐ Yes ☐ No Are loose wire connections or cables that are frayed or otherwise damaged repaired or replaced?
- ☐ Yes ☐ No Are poorly fitting plugs in socket connections changed when loose, corroded, or bent severely?
- ☐ Yes ☐ No Are extension cords not strung around door jams or placed under rugs with tacks or fasteners, causing insulation failure from wear and tear?
- ☐ Yes ☐ No Are all electrical panels secured from unauthorized personnel?
- ☐ Yes ☐ No Are double adaptors in use?
- ☐ Yes ☐ No Is there an adequate number of electrical receptacles?
- ☐ Yes ☐ No Are all cords/leads in good condition?
- ☐ Yes ☐ No Are ground fault circuit interrupters (GFCIs) used around sources of water?
- ☐ Yes ☐ No Are electrical cables/cords kept clear of walkways?
- ☐ Yes ☐ No Are all main circuit breaker or switch locations known, accessible, and correctly labeled?
- ☐ Yes ☐ No Are electrical extension cords uncoiled before use?
- ☐ Yes ☐ No Are all machine and equipment switches functioning correctly?
- ☐ Yes ☐ No Is all electrical equipment correctly installed?
- ☐ Yes ☐ No Are electrical appliances off overnight?
- ☐ Yes ☐ No Is lockout/tagout used on electrical circuitry?

Slips, Trips, and Falls

- ☐ Yes ☐ No Do power cords for computer and other equipment extend into walkways or aisle ways, presenting trip/fall hazards?
- ☐ Yes ☐ No Are filing stools or wastebaskets placed where they might be tripping hazards?

- ☐ Yes ☐ No Are all drawers kept closed?
- ☐ Yes ☐ No Do workers wear stable shoes that have non-slip soles?
- ☐ Yes ☐ No Are all spills cleaned immediately?

Elevators

- ☐ Yes ☐ No Are passenger and freight elevators inspected annually and are the inspection certificates available for review onsite?

Equipment and Tools

- ☐ Yes ☐ No Have electrical appliance and equipment leads been checked recently?
- ☐ Yes ☐ No Is electrical equipment in safe condition?
- ☐ Yes ☐ No Are computers appropriately situated on desks?
- ☐ Yes ☐ No Does any equipment have sharp metal projections?
- ☐ Yes ☐ No Are hand and power tools inspected prior to use?
- ☐ Yes ☐ No Are all electrical tools double-insulated and appropriately grounded?
- ☐ Yes ☐ No Are damaged tools removed from service?
- ☐ Yes ☐ No Are any items of mechanical cutting equipment (such as paper cutters or shredders) adequately guarded to prevent contact with potentially hazardous moving parts?
- ☐ Yes ☐ No Is equipment damaged or outdated?
- ☐ Yes ☐ No Are guards on all moving parts and points-of-operation?
- ☐ Yes ☐ No Are tools properly stored when not in use?
- ☐ Yes ☐ No Are electrical fans provided with guards of not over one-half inch, preventing finger exposures?
- ☐ Yes ☐ No Are tools and machinery inspected regularly for wear or leaks?
- ☐ Yes ☐ No Is equipment repaired promptly?
- ☐ Yes ☐ No Are drip pans or absorbent materials used if leaks cannot be stopped at the source?
- ☐ Yes ☐ No Is a machine that splashes oil fitted with a screen or splash guard?
- ☐ Yes ☐ No Are machines and tools cleaned regularly?
- ☐ Yes ☐ No Do only authorized employees utilize facility equipment?
- ☐ Yes ☐ No Are preventive maintenance records kept on equipment?

Photocopiers and FAX Machines

- ☐ Yes ☐ No Are photocopiers located away from personal workstations?
- ☐ Yes ☐ No Are they suitably placed and easily accessible?
- ☐ Yes ☐ No Is there adequate ventilation?
- ☐ Yes ☐ No Is the staff instructed not to leave the cover open/up?
- ☐ Yes ☐ No Is toner carefully handled (as per Material Safety Data Sheet)?
- ☐ Yes ☐ No Have staff been informed of the precautions to observe when changing toner cartridges?
- ☐ Yes ☐ No Where large multi-run/collating photocopiers are used, are they sited?
- ☐ Yes ☐ No Whenever possible, is the photocopier in an area where persons do not continually work?

Ladders

- ☐ Yes ☐ No Are ladders inspected for damage and removed from service if damaged?
- ☐ Yes ☐ No Have workers been trained in ladder safety?
- ☐ Yes ☐ No Are paths of traffic flow secured at the base of ladders?
- ☐ Yes ☐ No Is there a variety of ladders proper for the specific job?
- ☐ Yes ☐ No Do workers not stand on the top two steps of a step ladder?
- ☐ Yes ☐ No Are metal ladders not used around electrically energized conductors?

Personal Protective Equipment (PPE)

- ☐ Yes ☐ No Has a hazard assessment been done to determine what PPE is needed?
- ☐ Yes ☐ No Is personal protective equipment being used by workers?
- ☐ Yes ☐ No Have workers been trained in the use of PPE?

Security

- ☐ Yes ☐ No Is security a part of providing a safe workplace?
- ☐ Yes ☐ No Do entry and exit procedures provide workers personal security at night?

APPENDIX E

SAMPLE AND BLANK MATERIAL SAFETY DATA SHEETS

APPENDIX E

MSDS *Material Safety Data Sheet*

From: CDR Chemicals, Inc.

7 Resline Drive
Salem, NJ 0876424 Hour Emergency Telephone: 918-810-2351
CHEMTREC: 1-800-424-9310National Response in Canada
CANUTEC: 913-499-9889Outside U.S. and Canada
Chemline: 703-527-5867All non-emergency questions should be
directed to Customer Service (1-866-999-1300)
for assistance.**ACETONE**

MSDS Number: A0446 -- Effective Date: 04/10/01

1. Product Identification

Synonyms: Dimethylketone; 2-propanone; dimethylketal

CAS No.: 67-64-1

Molecular Weight: 58.08

Chemical Formula: $(CH_3)_2CO$

Product Codes:

J.T. Baker: 5156, 5580, 5805, 9001, 9002, 9003, 9004, 9005, 9006, 9007, 9008, 9009,
9010, 9015, 9036, 9125, 9254, 9271, A-124, V655Mallinckrodt: 0018, 2432, 2435, 2437, 2438, 2440, 2443, 2445, 2850, H451, H580,
H951**2. Composition/Information on Ingredients**

Ingredient:	CAS No.	Percent	Hazardous
Acetone	67-64-1	99.99%	Yes

3. Hazards Identification**Emergency Overview****DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY
CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES**

IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT, AFFECTS CENTRAL NERVOUS SYSTEM.**J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)**

Health Rating: 1 - Slight

Flammability Rating: 4 - Extreme (Flammable)

Reactivity Rating: 2 - Moderate

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES;
CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects**Inhalation:**

Inhalation of vapors irritates the respiratory tract. May cause coughing, dizziness, dullness, and headache. Higher concentrations can produce central nervous system depression, narcosis, and unconsciousness.

Ingestion:

Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts may produce abdominal pain, nausea and vomiting. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms are expected to parallel inhalation.

Skin Contact:

Irritating due to defatting action on skin. Causes redness, pain, drying and cracking of the skin.

Eye Contact:

Vapors are irritating to the eyes. Splashes may cause severe irritation, with stinging, tearing, redness and pain.

Chronic Exposure:

Prolonged or repeated skin contact may produce severe irritation or dermatitis.

Aggravation of Pre-existing Conditions:

Use of alcoholic beverages enhances toxic effects. Exposure may increase the toxic potential of chlorinated hydrocarbons, such as chloroform, trichloroethane.

4. First Aid Measures**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT

INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

5. Fire Fighting Measures

Fire:

Flash point: -20°C (-4°F) CC

Autoignition temperature: 465°C (869°F)

Flammable limits in air % by volume

lul: 2.5; ul: 12.8

Extremely Flammable Liquid and Vapor! Vapor may cause flash fire.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. This material may produce a floating fire hazard. Sensitive to static discharge.

Fire Extinguishing Media:

Dry chemical, alcohol foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CFR41.A) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB(R) solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

Acetone:

-OSHA Permissible Exposure Limit (PEL):

1000 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):

500 ppm (TWA), 750 ppm (STEL) A4 - not classifiable as a human carcinogen

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation: A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face organic vapor respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:**

Air-purifying respirators do not protect workers in oxygen-deficient atmospheres

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless, volatile liquid.

Odor:

Fragrant, mint-like

Solubility:

Miscible in all proportions in water

Specific Gravity:

0.79 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

56.5C (133F) @ 760 mm Hg

Melting Point:

-9C (-13F)

Vapor Density (Air=1):

2.0

Vapor Pressure (mm Hg):

400 @ 19.5C (104F)

Evaporation Rate (BuAc=1):

ca. 7.7

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Concentrated nitric and sulfuric acid mixtures, oxidizing materials, chloroform, alkalis, chlorine compounds, acids, potassium t-butoxide

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 5800 mg/kg; Inhalation rat LC50: 50,100mg/m3; irritation eye rabbit, Standard Draize, 20 ug severe; investigated as a tumorigen, mutagen, reproductive

effector.

Cancer Data:

Ingredient:

---HIF Anticancer---

IARC Category

Acetone (100-84-1)

No

No

None

12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is expected to readily biodegrade. When released to water, this material is expected to quickly evaporate. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material is expected to be readily removed from the atmosphere by wet deposition.

Environmental Toxicity:

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ACETONE

Hazard Class: 3

UN/NA: UN1090

Packing Group: II

Information reported for product/sizes: 350LB

International (Water, I.M.O.)

Proper Shipping Name: ACETONE
Hazard Class: 3.1
UN/NA: UN1090
Packing Group: II
Information reported for product/size: 350LB

15. Regulatory Information

-----VChemical Inventory System Part 15----- Ingredient	TCGA	PC	Export	Australia
Acetone (67-64-1)	Yes	Yes	Yes	Yes

-----VChemical Inventory System Part 15----- Ingredient	Canada RSCC	USC	MSD	Phil.
Acetone (67-64-1)	Yes	Yes	So	Yes

-----VFederal, State & International Regulations Ingredient	SDS 500- AQ	FSQ	Part 15 List	-----SARA 313----- CHEMICAL Catg.
Acetone (67-64-1)	No	No	Yes	So

-----VFederal, State & International Regulations Ingredient	CLP/SLA	Part 15 262.33	-----SARA----- 810
Acetone (67-64-1)	SC00	0002	No

Chemical Weapons Convention: No TSCA 1201: Yes CIPA: Yes
 SARA 311/312: Acute: Yes Chronic: No Riser: Yes Pressure: No
 Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2[Y]E
Poison Schedule: No information found.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 1 Flammability: 3 Reactivity: 0

Label Hazard Warnings:

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES

IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

Label Precautions:

Keep away from heat, sparks and flame

Keep container closed.

Use only with adequate ventilation

Wash thoroughly after handling.

Avoid breathing vapor.

Avoid contact with eyes, skin and clothing.

Label First Aid:

Aspiration hazard If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

Section III - Physical/Chemical Characteristics

Boiling Point		Specific Gravity ($H_2O = 1$)	
Vapor Pressure (mm Hg.)		Melting Point	
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	
Solubility in Water			
Appearance and Odor			

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
Extinguishing Media			
Special Fire Fighting Procedures			
Unusual Fire and Explosion Hazards			

(Reproduce locally)

CSHA 174, Sept. 1985

Stability	Justable	Conditions to Avoid
	Stable	
Incompatibility (Materials 14.4 and)		
Hazardous Decomposition or Byproducts		
Hazardous Polymerization	May Occur	Conditions to Avoid
	Will Not Occur	

Section VI - Health Hazard Data

Routes of Entry	Inhalation?	Skin?	Ingestion?
Health Hazards (acute and Chronic)			
Carcinogenicity	NTP?	IARC Monographs?	OSHA Regulated?
Signs and Symptoms of Exposure			
Medical Conditions Generally Aggravated by Exposure			
Emergency and First Aid Procedures			

APPENDIX F

DISINFECTANT SELECTION TABLE

APPENDIX F

DISINFECTANT
SELECTION TABLE

Compound	Chlorine 0.01-5%	Iodine Iodopho 0.5-5%	Chlorhexidine 0.05-0.5%	Alcohol 70-95%	Oxidizing 0.20-3%	Phenol 0.2-3%	Quaternary Ammonium -1/-2%	Aldehyde 1-2%
Examples	Clorox	Tincture/ Provodeine	VikronS		Novalsan	Lysol	Roccal-D	Wavicide
Bactericidal	Good	Good	Very Good	Good	Good	Good	Good	Very Good
Viricidal	Very Good	Good	Very Good	Good	Good	Fair	Fair	Very Good
Envelope viruses	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Non-envelope viruses	Yes	Yes	No	No	Yes	No	No	Yes
Bacterial spores	Fair	Fair	Poor	Fair	Fair- Good	Poor	Poor	Good
Fungicidal	Good	Good	Fair to Good	Fair	Fair	Good	Fair	Good
Protozoal parasites	Fair strong Conc	Poor	Poor	Poor	Poor	Poor	Fair (Ammonia)	Good
Effective in organic matter	Poor	Fair	Fair	Fair	Poor	Good	Poor	Good
Inactivated by soap	No	No and Yes	No	No	No	No	Yes	No
Effective in hard water	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Contact time (minutes)	5-30	10-30	5-10	10-30	10-30	10-30	10-30	10-600
Residual activity	Poor	Poor	Good	Fair	Poor	Poor	Fair	Fair

APPENDIX G

**HAZARD ASSESSMENT
CERTIFICATION FORM
FOR PERSONAL
PROTECTIVE EQUIPMENT**

APPENDIX G

HAZARD ASSESSMENT
CERTIFICATION FORM

Date:	Location:
Assessment Conducted By:	
Specific Tasks Performed at this Location:	

Hazard Assessment and Selection of Personal Protective Equipment

I. Overhead Hazards—

Hazards to consider include:

- Suspended loads that could fall.
- Overhead beams or loads that could be hit against.
- Energized wires or equipment that could be hit against.
- Employees working at elevated sites who could drop objects on others below.
- Sharp objects or corners at head level.

Hazards Identified:

Head Protection

Hard Hat:	Yes	No
If yes:		
<input type="checkbox"/> Type A (impact and penetration resistance, plus low-voltage electrical insulation).		
<input type="checkbox"/> Type B (impact and penetration resistance, plus high-voltage electrical insulation).		
<input type="checkbox"/> Type C (impact and penetration resistance).		

II. Eye and Face Hazards—

Hazards to consider include:

- Chemical splashes.
- Dust.
- Smoke and fumes.
- Welding operations.
- Lasers/optical radiation.
- Projectiles.

Hazards Identified:

Eye Protection

Safety glasses or goggles	Yes	No
Face shield	Yes	No

III. Hand Hazards—

Hazards to consider include:

- Chemicals.
- Sharp edges, splinters, etc.
- Temperature extreme.
- Biological agents.
- Exposed electrical wires.
- Sharp tools, machine parts, etc.
- Material handling.

Hazards Identified:

Hand Protection

Gloves	Yes	No
<input type="checkbox"/> Chemical resistant		
<input type="checkbox"/> Temperature resistant		
<input type="checkbox"/> Abrasion resistant		
<input type="checkbox"/> Other (Explain)		

IV. Foot Hazards—

Hazards to consider include:

- Heavy materials handled by employees.
- Sharp edges or points (puncture risk).
- Exposed electrical wires.
- Unusually slippery conditions.
- Wet conditions.
- Construction/demolition.

Hazards Identified:

Foot Protection

Safety shoes	Yes	No
Types: <input type="checkbox"/> Toe protection <input type="checkbox"/> Metatarsal protection <input type="checkbox"/> Puncture resistant <input type="checkbox"/> Electrical insulation <input type="checkbox"/> Other (Explain)		

V. Other Identified Safety and/or Health Hazards:

Hazard	Recommended Protection

I certify that the above inspection was performed to the best of my knowledge and ability, based on the hazards presented on _____.

(Signature)

APPENDIX H

**AGENTS, DOSES,
AND SYMPTOMS
FROM NBCs**

APPENDIX H

AGENTS, DOSES,
AND SYMPTOMS
FROM NBCs

Summary of Clinical Symptoms of Radiation Sickness

TIME AFTER EXPOSURE	Survival improbable (700 rem or more)	Survival possible (300 to 550 rem)	Survival probable (100 to 250 rem)
1ST HOURS	Nausea, vomiting, and diarrhea in first few hours.	Nausea, vomiting, and diarrhea in first few hours.	Possible nausea, vomiting, and diarrhea on first day.
1ST WEEK	No definite symptoms in some cases (latent period)	No definite symptoms (latent period)	No definite symptoms (latent period)
2ND WEEK	Diarrhea Hemorrhage Purpura (skin hemorrhages) Inflammation of the mouth and throat Fever Rapid emaciation Death (mortality—probably 100% without medical treatment)		
3RD WEEK		Epilation (hair loss) Loss of appetite and general malaise (discomfort) Fever Hemorrhage Purpura (skin hemorrhages) petecheiae, (skin spots) nosebleeds, pale skin Inflammation of the mouth and throat. Diarrhea Emaciation (extreme malnutrition)	Epilation (hair loss) Loss of appetite and malaise Hemorrhage Purpura Petecheiae Pale skin Diarrhea Moderate emaciation
4TH WEEK		Death in most serious cases, (mortality—50% for 450 rem without medical treatment)	Recovery likely in about 3 months unless complication by previous poor health or superimposed injuries or infections.

Effects of Acute Whole Body Radiation Doses

Acute Dose (rems)	Probable Effect
0-20	No obvious effect. No injury or disability. Could be detected by chromosome analysis.
20-50	Minor blood changes.
60-120	Vomiting and nausea for about one day in 5 to 10 percent of those exposed. Fatigue, but no serious disability.
130-170	Vomiting and nausea for about 1 day, followed by other symptoms of radiation sickness (increased temperature, blood changes, fatigue) in about 25 percent of those exposed. No deaths anticipated.
180-220	Vomiting and nausea for about one day followed by other symptoms of radiation sickness in about 50 percent of those exposed. No or few deaths anticipated.
270-330	Vomiting and nausea in nearly all those exposed on first day, followed by other symptoms of radiation sickness. About 20 percent of the group will die within 2-6 weeks after exposure; survivors convalesce for about 3 months.
400-500	Vomiting and nausea in all those exposed on the first day, followed by other symptoms of radiation sickness. Bone marrow destruction (reversible). Without medical treatment 50 percent of the group will die within a month. Survivors convalesce for about six months.
550-750	Vomiting and nausea to all those exposed within four hours, followed by other symptoms of radiation sickness. Irreversible destruction of bone marrow. Deaths in 100 percent of the group is expected.
1000 to 5000	Vomiting, diarrhea and nausea in all those exposed within 1 to 2 hours. Damage primarily to the digestive system. First and second degree burns of the skin. Death will occur to entire group in 3-10 days. There is no medical treatment to prevent death after this high of a dose. <i>NOTE:</i> These are the doses used to treat cancer but those treatments are kept in small areas of the body.
5000-10,000	Unconscious minutes after exposure. Death within 48 hours due to nervous system damage.

With proper medical attention the chances of survival are excellent even for very high absorbed doses. Radiotherapy treatment for cancer patients often exposes the tumor area to protracted doses of several thousand rem over a period of six to eight weeks. Recall that the federal dose limit is 3 rem per quarter.

Biological Disease Symptoms

<i>Disease</i>	<i>Germ</i>	<i>Symptoms</i>	<i>Treatment</i>
Anthrax (bacterial)	Bacillus anthracis	Inhalation: Fever, fatigue, chest pain, difficulty breathing Skin: Fever, fatigue, headache, swollen lymph nodes and skin ulcer Gastrointestinal: Sore throat, difficulty swallowing, fever, swollen lymph nodes, vomiting blood or bloody diarrhea	Antibiotics, if prescribed early Antibiotics Antibiotics, if prescribed early
Botulism (bacterial)	Clostridium botulinum	Progressive paralysis, respiratory	If given early, equine antitoxin treats most cases
Cholera (bacterial)	Vibrio cholerae	Acute diarrhea, vomiting, leg cramps	Immediate replacement of fluids Antibiotics can shorten course and diminish severity of illness
Hemorrhagic fevers (viral)	Several viruses	Vary by type, but often include fever, headache, dizziness, muscle aches, abnormal bleeding	No treatment other than supportive therapies
Pneumonic plague (bacterial)	Yersinia pestis	High fever, chills, headache, cough with bloody sputum	Several antibiotics, including streptomycin, tetracycline and chloramphenicol
Q fever (bacterial)	Coxiella burnetii	Fever, headache, weakness, severe sweating	Doxycycline is most effective when initiated within the first three days
Salmonellosis	Salmonella	Diarrhea, fever, chills, dehydration	Usually resolves in 5 to 10 days and does not require treatment in most cases
Smallpox (viral)	Viola virus	High fever, aches (mostly back), rash on arms, legs, palms of hands, soles of feet	Vaccination up to 4 days after exposure; no proven treatment later; antibiotics for secondary bacterial infections
Tularemia (bacterial)	Francisella tularensis	Fever, headache, tiredness, chest discomfort, loss of appetite, cough	Antibiotics such as streptomycin or gentamicin

Chemical Weapons and Their Symptoms			
Class: Blister Agents			
Name	Means of Exposure	Physical Characteristics and Warning Properties	Symptoms
Sulfur Mustard (HD)	Skin contact and/or inhalation.	Colorless to amber, oily liquid with odor of garlic.	Delayed onset (tissue damage occurs immediately, but signs of exposure and pain occur 2 to 24 hours later). Blisters on skin; coughing (lesions on lungs); itchiness or burning sensation in eyes, and possibly nausea and vomiting.
Lewisite (L)	Skin contact and/or inhalation.	Light amber liquid with odor of geraniums. inhalation.	Blisters on skin; burning, watery, and swollen eyes; coughing (upper airway irritation), and blood poisoning.
Nitrogen Mustard (HN-3)	Skin contact and/or inhalation.	Amber odorless liquid. inhalation.	Blisters on skin; lung damage.
Mustard-Lewisite	Skin contact and/or inhalation.	Liquid with garlic odor.	Blisters on skin; burning eyes, and lung damage

Class: Nerve Agents			
Name	Means of Exposure	Physical Characteristics & Warning Properties	Symptoms
Tabun (GA)	Skin contact and/or inhalation.	Brownish to colorless liquid with odor ranging from none to fruity.	Dim or blurred vision, runny nose, chest tightness, muscle twitches, heart rate irregularities, nausea, vomiting; high concentrations lead to loss of consciousness and seizures paralysis and resulting in death.
Sarin (GB)	Inhalation mostly; limited exposure through skin.	Colorless liquid with no odor.	
Nitrogen Mustard (HN-3)	Skin contact and/or inhalation.	Amber odorless liquid.	
Soman (GD)	Skin contact and/or inhalation.	Colorless liquid with fruity to camphor-like odor.	
GF	Skin contact and/or inhalation.	Colorless liquid with no odor.	
VX	Skin contact and/or inhalation.	Amber liquid with no odor.	Similar to other nerve agents, but lethal dose is one-tenth to one-fifth of the other nerve agents.
Novichok agents.	Unknown.	Unknown.	

Class: Choking Agents			
Name	Means of Exposure	Physical Characteristics & Warning Properties	Symptoms
Chlorine	Inhalation.	Colorless to slightly yellow gas with sharp irritating odor	Shortness of breath, nose and throat irritation, painful coughing, tightness of chest; within 48 hours, fluid build-up in lungs results in fatal choking (like drowning).
Phosgene (CG)	Inhalation.	Colorless gas with odor of freshly mown hay or corn.	
Diphosgene (DP)	Inhalation.	Colorless liquid with odor of freshly mown hay or corn.	
Chloropicrin (PS)	Inhalation.	Oily, colorless liquid with pungent odor	Vomiting and fluid build-up in lungs.

Class: Blood Agents			
Name	Means of Exposure	Physical Characteristics & Warning Properties	Symptoms
Hydrogen Cyanide (AC)	Inhalation.	Colorless gas with odor of bitter almonds.	Vomiting, dizziness, watery eyes, and deep and rapid breathing; high concentrations lead to convulsions, inability to breathe, loss of consciousness, and death.
Cyanogen Chloride (CK)	Inhalation.	Colorless liquid with sharp, pungent odor.	

Class: Riot Control (Incapacitating) Agents			
Name	Means of Exposure	Physical Characteristics & Warning Properties	Symptoms
CN	Inhalation.	Gray solid with sharp, irritating floral odor.	Instant pain in eyes and nose, severe watery eyes, coughing, chest tightness, vomiting if high doses or sensitive individual.
CS	Inhalation.	White crystalline substance with pepper like odor.	
Psychedelic Agent 3 (BZ).	Inhalation.	White crystalline solid with no odor.	Causes hallucinations, stupor, forgetfulness, and confusion

APPENDIX I

WORKPLACE VIOLENCE SECURITY PROGRAM

APPENDIX I

WORKPLACE VIOLENCE SECURITY PROGRAM

Does establishment's program for workplace security address the hazards known to be associated with the three major types of workplace violence? Type I workplace violence involves a violent act by an assailant with no legitimate relationship to the workplace who enters the workplace to commit a robbery or other criminal act. Type II involves a violent act or threat of violence by a recipient of a service provided by our establishment, such as a client, patient, customer, passenger or a criminal suspect or prisoner. Type III involves a violent act or threat of violence by a current or former worker, supervisor or manager, or another person who has some employment-related involvement with our establishment, such as a worker's spouse, lover, relative, friend, or another person who has a dispute with one of our workers.

RESPONSIBILITY

We have decided to assign responsibility for security in our workplace. The security program administrator for workplace security is _____ who has the authority and responsibility for implementing the provisions of this program for _____.

All managers and supervisors are responsible for implementing and maintaining this security program in their work areas and for answering worker questions about the security program. A copy of this security program is available from each manager and supervisor.

COMPLIANCE

We have established the following policy to ensure compliance with our rules on workplace security. Management of our establishment is committed to ensuring that all safety and health policies and procedures involving workplace security are clearly communicated and understood by all workers. All workers are responsible for using safe work practices, for following all directives, policies and procedures, and for assisting in maintaining a safe and secure work environment. Our system of ensuring that all workers, including supervisors and managers, comply with work practices that are designed to make the workplace more secure, and do not engage in threats or physical actions that create a security hazard for others in the workplace, include:

1. Informing workers, supervisors and managers of the provisions of our security program.

- 2. Evaluating the performance of all workers in complying with our establishment's workplace security measures.
- 3. Recognizing workers who perform work practices that promote security in the workplace.
- 4. Providing training and/or counseling to workers whose performance is deficient in complying with work practices designed to ensure workplace security.
- 5. Disciplining workers for failure to comply with workplace security practices.
- 6. The following practices that ensure worker compliance with workplace security directives, policies and procedures:

COMMUNICATION

At our establishment, we recognize that to maintain a safe, healthy and secure workplace we must have open, two-way communication between all workers, including managers and supervisors, on all workplace safety, health and security issues. Our establishment has a communication system designed to encourage a continuous flow of safety, health and security information between management and workers without fear of reprisal and in a form that is readily understandable. Our communication system consists of the following checked items:

- New worker orientation on our establishment's workplace security policies, procedures and work practices.
 - Periodic review of our security program with all personnel.
 - Training programs designed to address specific aspects of workplace security unique to our establishment.
 - Regularly scheduled safety meetings with all personnel that include workplace security discussions.
 - A system to ensure that all workers, including managers and supervisors, understand the workplace security policies.
 - Posted or distributed workplace security information.
 - A system for workers to inform management about workplace security hazards or threats of violence.
 - Procedures for protecting workers who report threats from retaliation by the person making the threats.
 - Addressing security issues at our workplace security team meetings.
 - Our establishment has fewer than ten workers and communicates with and instructs workers orally about general safe work practices with respect to workplace security.
 - Other: _____
-
-

HAZARD ASSESSMENT

We will be performing workplace hazard assessment for workplace security in the form of periodic inspections. Periodic inspections to identify and evaluate workplace security hazards and threats of workplace violence are performed by the following observer(s) in the following areas of our workplace:

Observer	Area

Periodic inspections are performed according to the following schedule:

- 1. _____;
Frequency (daily, weekly, monthly, etc.)
- 2. When we initially established our security program;
- 3. When new, previously unidentified security hazards are recognized;
- 4. When occupational injuries or threats of injury occur; and
- 5. Whenever workplace security conditions warrant an inspection.

Periodic inspections for security hazards consist of identification and evaluation of workplace security hazards and changes in worker work practices and may require assessing for more than one type of workplace violence. Our establishment performs inspections for each type of workplace violence by using the methods specified below to identify and evaluate workplace security hazards.

Inspections for Type I (individual has no legitimate business relationship to the workplace) workplace security hazards include assessing:

- 1. The exterior and interior of the workplace for its attractiveness to robbers.
- 2. The need for security surveillance measures, such as mirrors or cameras.
- 3. Posting of signs notifying the public that limited cash is kept on the premises.
- 4. Procedures for worker response during a robbery or other criminal act.
- 5. Procedures for reporting suspicious persons or activities.
- 6. Posting of emergency telephone numbers for law enforcement, fire and medical services where workers have access to a telephone with an outside line.
- 7. Limiting the amount of cash on hand and using timed access safes for large bills.
- 8. Other: _____

Inspections for Type II (individual is either a recipient or the object of a service provided by the affected workplace) workplace security hazards include assessing:

1. Access to, and freedom of movement within, the workplace.
2. Adequacy of workplace security systems, such as door locks, security windows, physical barriers and restraint systems.
3. Frequency and severity of threatening or hostile situations that may lead to violent acts by persons who are service recipients of our establishment.
4. Worker's skill in safely handling threatening or hostile service recipients.
5. Effectiveness of systems and procedures to warn others of a security danger or to summon assistance, e.g., alarms or panic buttons.
6. The use of work practices such as "buddy" systems for specified emergency events.
7. The availability of worker escape routes.
8. Other: _____

Inspections for Type III (individual has some employment-related involvement with the affected workplace) workplace security hazards include assessing:

1. How well our establishment's anti-violence policy has been communicated to workers, supervisors or managers.
2. How well our establishment's management and workers communicate with each other.
3. Our workers', supervisors' and managers' knowledge of the warning signs of potential workplace violence.
4. Access to, and freedom of movement within, the workplace by non-workers, including recently discharged workers or persons with whom one of our worker's is having a dispute.
5. Frequency and severity of worker reports of threats of physical or verbal abuse by managers, supervisors or other workers.
6. Any prior violent acts, threats of physical violence, verbal abuse, property damage or other signs of strain or pressure in the workplace.
7. Worker disciplinary and discharge procedures.
8. Other: _____

INCIDENT INVESTIGATIONS

We have established the following policy for investigating incidents of workplace violence. Our procedures for investigating incidents of workplace violence, which includes threats and physical injury, include:

1. Reviewing all previous incidents.
 2. Visiting the scene of an incident as soon as possible.
 3. Interviewing threatened or injured workers and witnesses.
 4. Examining the workplace for security risk factors associated with the incident, including any previous reports of inappropriate behavior by the perpetrator.
 5. Determining the cause of the incident.
 6. Taking corrective action to prevent the incident from recurring.
 7. Recording the findings and corrective actions taken.
 8. Other: _____

-

HAZARD CORRECTION

Hazards that threaten the security of workers shall be corrected in a timely manner based on severity when they are first observed or discovered. Corrective measures for Type I workplace security hazards can include:

1. Making the workplace unattractive to robbers.
2. Utilizing surveillance measures, such as cameras or mirrors, to provide information as to what is going on outside and inside the workplace.
3. Procedures for reporting suspicious persons or activities.
4. Posting of emergency telephone numbers for law enforcement, fire and medical services where workers have access to a telephone with an outside line.
5. Posting of signs notifying the public that limited cash is kept on the premises.
6. Limiting the amount of cash on hand and using timed access safes for large bills.
7. Worker, supervisor and management training on emergency action procedures.
8. Other: _____

Corrective measures for Type II workplace security hazards can include:

1. Controlling access to the workplace and freedom of movement within it, consistent with business necessity.
2. Ensuring the adequacy of workplace security systems, such as door locks, security windows, physical barriers and restraint systems.
3. Providing worker training in recognizing and handling threatening or hostile situations that may lead to violent acts by persons who are service recipients of our establishment.
4. Placing effective systems to warn others of a security danger or to summon assistance, e.g., alarms or panic buttons.
5. Providing procedures for a “buddy” system for specified emergency events.
6. Ensuring adequate worker escape routes.
7. Other: _____

Corrective measures for Type III workplace security hazards include:

1. Effectively communicating our establishment’s anti-violence policy to all workers, supervisors or managers.
2. Improving how well our establishment’s management and workers communicate with each other.
3. Increasing awareness by workers, supervisors and managers of the warning signs of potential workplace violence.
4. Controlling access to, and freedom of movement within, the workplace by non-workers, including recently discharged workers or persons with whom one of our worker’s is having a dispute.
5. Providing counseling to workers, supervisors or managers who exhibit behavior that represents strain or pressure which may lead to physical or verbal abuse of co-workers.
6. Ensure that all reports of violent acts, threats of physical violence, verbal abuse, property damage or other signs of strain or pressure in the workplace are handled effectively by management and that the person making the report is not subject to retaliation by the person making the threat.
7. Ensure that worker disciplinary and discharge procedures address the potential for workplace violence.
8. Other: _____

TRAINING AND INSTRUCTION

We have established the following policy on training all workers with respect to workplace security. All workers, including managers and supervisors, shall have training and instruction on general and job-specific workplace security practices. Training and instruction shall be provided when the security program is first established and periodically thereafter. Training shall also be provided to all new workers and to other workers for whom training has not previously been provided and to all workers, supervisors and managers given new job assignments for which specific workplace security training has not previously been provided. Additional training and instruction will be provided to all personnel whenever the employer is made aware of new or previously unrecognized security hazards. General workplace security training and instruction includes, but is not limited to, the following:

- 1. Explanation of the security program including measures for reporting any violent acts or threats of violence.
- 2. Recognition of workplace security hazards including the risk factors associated with the three types of workplace violence.
- 3. Measures to prevent workplace violence, including procedures for reporting workplace security hazards or threats to managers and supervisors.
- 4. Ways to defuse hostile or threatening situations.
- 5. Measures to summon others for assistance.
- 6. Worker routes of escape.
- 7. Notification of law enforcement authorities when a criminal act may have occurred.
- 8. Emergency medical care provided in the event of any violent act upon an worker; and
- 9. Post-event trauma counseling for those workers desiring such assistance.

In addition, we provide specific instructions to all workers regarding workplace security hazards unique to their job assignment, to the extent that such information was not already covered in other training.

We have chosen the following checked items for Type I training and instruction for managers, supervisors and workers:

- ☐ Crime awareness.
- ☐ Location and operation of alarm systems.
- ☐ Communication procedures.
- ☐ Proper work practices for specific workplace activities, occupations or assignments, such as late night retail sales, taxi-cab driver, or security guard.
- ☐ Other: _____

We have chosen the following checked items for Type II training and instruction for

managers, supervisors and workers:

- ☐ Self-protection.
- ☐ Dealing with angry, hostile or threatening individuals.
- ☐ Location, operation, care, and maintenance of alarm systems and other protective devices.
- ☐ Communication procedures.
- ☐ Determination of when to use the “buddy” system or other assistance from co-workers.
- ☐ Awareness of indicators that lead to violent acts by service recipients.
- ☐ Other: _____

We have chosen the following checked items for Type III training and instruction for managers, supervisors and workers:

- ☐ Preemployment screening practices.
- ☐ Worker assistance programs.
- ☐ Awareness of situational indicators that lead to violent acts.
- ☐ Managing with respect and consideration for worker well-being.
- ☐ Review of anti-violence policy and procedures.
- ☐ Other: _____

APPENDIX J

**ASSAULT INCIDENT
REPORT FORM**

APPENDIX J

ASSAULT INCIDENT
REPORT FORM

Note: This type of form can be used to report any threatening remark or act of physical violence against a person or property, whether experienced or observed. Individuals may be more forthcoming with information if the form is understood to be voluntary and confidential. The form also needs to identify where it should be sent after completion (for example, workplace violence prevention group or safety committee representative).

Date of incident	Year	Month	Day of week
Location of incident (Map, sketch on reverse side)			
Name of victim		Gender Male___Female___	
Victim description ____ Employee job title _____ ____ Client ____ Visitor		Member of labor organization? Yes _____ No _____	
Assigned work location (if employee)			
Supervisor		Has supervisor been notified? Yes _____ No _____	
Describe the assault incident.			
List any witnesses to the incident (name and phone).			
Did the assault involve a firearm? If so, describe.			

Did the assault involve another weapon (not a firearm)? If so, describe.

Was the victim injured? If yes, please describe.

Who was responsible for assault?

____Stranger

____Personal relation

____Client/patient/patron/customer

____Coworker

____Supervisor

____Other

If other, describe.

What was the gender of the person(s) who committed the assault?

____Male

____Female

Please check any risk factors applicable to this incident:

Note: Each company should develop and include a list of potential risk factors that may apply in its worksite. For example:

____working with money

____working in a high-crime area

____working with drugs

What steps could be taken to avoid a similar incident in the future?
(To avoid recreating trauma, sound judgment should be exercised in deciding when to request this information.)

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