

Chapter 32 – Office Safety

32.1 Scope

Office safety encompasses the responsibilities, regulation, and requirements that ensure a safe working environment for personnel in an office setting at Glenn Research Center (GRC). This chapter sets forth minimum safety requirements and guidelines to prevent accidents for all personnel performing administration related tasks.

32.2 Applicability

The provisions of this chapter are applicable to all NASA employees and to all other agencies, organizations and contractor personnel who perform administrative duties or work in an office setting within the confines of Glenn at Lewis Field in Cleveland and at the Plum Brook Station in Sandusky.

32.3 Policy

GRC will manage and conduct its operations in such a manner as to eliminate or minimize all potential hazards and to avoid accidents involving injury to personnel, damage to property, or loss of research/project operating time or effectiveness. Glenn management and supervisors are responsible for ensuring that everyone is provided with a workplace free of recognized hazards, or one that has appropriately engineered protective systems, and that GRC comply with all applicable Federal, State, Local, and contractual laws and regulations affecting the safety and health of Center employees. Everyone at Glenn, including contractors, has an obligation and a responsibility to comply with laws, regulations, and practices affecting personnel and facility safety, including those set forth in the Glenn Safety Manual (GSM). Achieving and maintaining a safe work environment requires that everyone cooperate and proactively participate in the Glenn Safety Program.

32.4 Responsibilities

32.4.1 Glenn Director

The Center Director is responsible for the establishment of a Glenn Safety and Accident Prevention Program in accordance with federal regulations, the “NASA Safety Manual,” NPG 8715.3, and other related guidelines set up by NASA Headquarters.

32.4.2 Chief of the Safety Branch

The Chief of the Safety Branch (SB) is responsible for the overall management, coordination, and documentation of the Glenn Safety Management System and, in conjunction with the Safety, Health and Environmental Board, for the implementation of Center safety policies and directives. The SB Chief serves as the Center focal point of communications on all life safety matters and on functional safety relationships between

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the Center and NASA Headquarters. (See Chapter 1, Safety and Health Management System for additional information).

32.4.3 Supervisor

All organization supervisors have a prime responsibility for compliance with pertinent safety requirements (including those related to housekeeping and shop safety) and for ensuring the effectiveness of the Glenn Safety Management System as it affects their specific activities.

32.4.4 Employees

Each Glenn and contractor employee is responsible for:

- Exercising reasonable care and caution in the safe performance of his or her work by reducing potential hazards while performing their assignments and in the conduct of any activity at the Center.
- Possessing knowledge of Glenn safety regulations, safe operating procedures, and emergency rescue procedures affecting his or her individual work area and work assignments and complying therewith.
- Reporting the development or appearance of any potentially hazardous condition to his or her supervisor and/or to the Environmental, Health and Safety helpline.

32.5 Introduction

Office-Related Illness and Injury

Changes have occurred in the American workplace because 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 not properly 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 pain 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 overexertion, falling objects, striking against objects, and being caught in or between objects.

32.6 Housekeeping

All NASA employees and contractor personnel are responsible for reducing potential hazards and keeping their work areas safe and clutter free. Good housekeeping

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guidelines include keeping aisles and stairways free from clutter, cleaning spills, minimizing combustibles in workplace and storage areas, and keeping all exits free from obstructions. By keeping the office floor neat and clean, you can eliminate most slip, trip, and fall hazards. Many office accidents are caused by poor housekeeping practices. Other good housekeeping practices include the following:

- a. Maintain walkways so that everyone can enter and exit without tripping over items.
- b. Ensure that office lighting is adequate.
- c. To prevent slips, trips, and falls quickly clean or barricade spills. Never walk on wet floors.
- d. Report any loose or worn flooring to the Work Control Office at 433-4948.
- e. Emergency egress paths shall be maintained at a minimum of 32 inches.
- f. No office/workstation, copiers, or mail stations shall be placed in hallways or exit ways.
- g. Loose paper increases the fire load and the fire potential in the office area and should not exceed a total of 10 pounds. No paper or cardboard boxes are permitted on the floor. Paper storage should be in file cabinets, bookcases or cabinets designed for that purpose.

32.7 Material Storage

Office materials that are improperly stored can lead to objects falling on workers, poor visibility, and create a 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:

- a. The egress route must be accessible, with no storage of materials in aisles, corners, or passageways.
- b. Books should be kept on shelving or neatly stored.
- c. No loose storage should be placed above 6 feet or on top of cabinets.
- d. Heavy objects should be located on low shelving.
- e. Cardboard boxes shall not be used for permanent storage.
- f. No chemical storage is permitted in office areas.

32.8 Falls

The leading types of disabling accidents that occur within the office are the result of falls. 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,

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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:

- a. To prevent slips, trips, and falls quickly clean or barricade spills.
- b. Never walk on wet floors.
- c. Carpeting should be in good condition to prevent trip hazards. Report any loose or worn flooring to the Work Control Office at 433-4948.
- d. Be sure the pathway is clear before you walk.
- e. Avoid excessive bending, twisting, and leaning backward while seated.
- f. Always use a stepladder for overhead reaching. Chairs should never be used as ladders.
- g. Pick up objects co-workers may have left on the floor.
- h. Do not obstruct your view when carrying objects along walkways or when ascending/descending stairways.
- i. Employees are expected to wear footwear appropriate for the duties of their employment:
 - Sandals or other open-toe style shoes are not permitted in shop or lab areas and are discouraged in office areas.
- j. File Cabinet Safety:
 - Store the heaviest materials in the bottom drawer.
 - Never leave the upper drawers of a file cabinet open.
 - Open only one drawer at a time.
 - Never open a drawer if someone is crouched below it.
 - Shut a file drawer immediately after removing files.
 - Use the handle when closing a drawer to help reduce pinch-point injuries.

If you find yourself heading for a fall, remember – roll, do not 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.

32.9 Strains and Overexertion

Although a typical office job may not involve lifting large or especially heavy objects, it is important to follow the principles of safe lifting. Small, light loads (i.e., 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:

- a. Is this too heavy for me to lift and carry alone?
- b. How high do I have to lift it?
- c. How far do I have to carry it?

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d. 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.

32.9.1 Proper Safe Lifting Steps:

- a. Take a balanced stance; feet placed shoulder-width apart. When lifting something from the floor, squat close to the load.
- b. Keep your back in its neutral or straight position. Tuck in your chin so your head and neck continue the straight back line.
- c. Grip the object with your whole hand, rather than only with your fingers. Draw the object close to your body to keep the load and your body weight centered.
- d. 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.
- e. Never twist when lifting. When you must turn with a load, turn your whole body, feet first.
- f. Never carry a load that blocks your vision.
- g. To set something down, use the same body mechanics designed for lifting.

32.10 Caught in or Between Objects

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

- a. Fingers caught in a drawer, door, or window.
- b. Fingers, hair or articles of clothing and jewelry caught in office machines.
- c. Fingers caught under the knife-edge of a paper cutter.
- d. While working on office equipment, concentrate on what you are doing.

32.11 Office Ergonomics

Computer use has increased dramatically over the past decade with over 50 million personal computers in use in the U.S. Video Display Terminals (VDT's) are faster than traditional type writers; unfortunately, speed comes with a price – no breaks. When you think of office work you think of upper extremity Cumulative Trauma Disorders. However an office worker is 40 times more likely to experience back pain than pain in the upper extremity. While there has been an increase of severity and lost work days, the incidence for back pain has not changed significantly. Eye strain is the most frequent physical symptom suffered by VDT users. There are many warning signs that should alert the computer user to a potential health problem; however, nothing replaces a physician's diagnosis:

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- a. Repeating the same motion every few seconds for more than 2 hours continuous or 4 hrs/day.
- b. Maintaining an unsupported fixed or awkward posture for more than one hour continuous or 4 hrs/day.
- c. Using forceful hand exertion for more than 2 hours daily.

Ergonomics means fitting the workplace to the worker by modifying or redesigning the job, workstation, tool or environment. Workstation design can have a big impact on an office workers health and well-being.

- a. Arrange your workstation to require a minimum amount of lifting, bending and stretching as you work. Your desk and chair should be at a comfortable height. This could mean raising your chair, lowering your workbench or obtaining a footrest. Lay out tools and materials where you can reach them and store materials on shelves at a comfortable height so you don't have to do as much lifting.
- b. Adapt your tools. Use tools, which are designed to keep your hands, arms and back in a comfortable, natural position while you work. Use tools with longer, padded handles, or angled better to lessen strain and vibration.
- c. Office furniture is the cause of many serious injuries. Furniture should be in good condition. Bolts, screws, hinge and handles for doors and drawers should be secure.
- d. Poor chairs and/or bad postures can cause lower back strain; or a chair that is too high can cause circulation loss in legs and feet.
- e. Any wheeled chair should have five legs. Make sure all chairs and stools are sturdy and in good condition. Remove any unsafe or damaged chairs from service so they can be repaired or disposed of properly.
- f. Adequate lighting is important to prevent eyestrain and injuries. Burned out lights should be replaced promptly.
- g. Take frequent short breaks. You don't have to stop working. Plan your work so you can switch from one task to another to avoid back problems and repetitive strain injuries. Be sure to use your scheduled breaks to stretch and move around. These habits can help prevent cumulative injuries to your muscles and joints.
- h. Pay attention to how you feel when you work.

32.12 Office 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, which 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 a high resistance and can be used to prevent the flow of electrical current. If a part of the body encounters the electrical circuit, a shock will

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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, burn, 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 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 because of faulty or defective equipment, unsafe installation, or misuse of equipment on the part of office workers.

32.12.1 Ungrounded Equipment

Grounding is a method of protecting employees from electric 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 hazardous or wet locations, if operated at more than 150 volts to ground, or if it is of a certain type of equipment (such as refrigerators and air conditioners). Smaller office equipment, such as typewriters and coffee pots, would generally not fall into these categories and therefore would not have to be grounded. However much of the newer office equipment is manufactured with grounded plugs as a precaution (three prong plugs). In such cases, the equipment shall be used in accordance with the manufacturer's instructions. In any case, never remove the third (grounding) prong from any three-prong piece of equipment.

32.12.2 Overloaded Outlets

Insufficient or overloading of 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.

32.12.3 Unsafe/Non-Approved Equipment

Fans, surge protectors, and personal heaters must be UL listed and used in accordance with the manufacturers' recommendations.

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 current leakage to ground. If wires are exposed, they may cause a shock to a worker who contacts them. Defective cords shall be replaced. Electric cords should be examined on a routine basis for fraying and exposed wiring.

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32.12.4 Improper Placement of Cords

An electrical cord shall not be pulled or dragged over nails, hooks, or other sharp objects that may cause cuts in the insulation. In addition, cords shall never be pipes, walls, and furniture, since files and bookcases may be pushed tightly against electric outlets, bending the cord at the plug.

32.12.5 Extension cords

Extension cords shall not be used in place of fixed wiring.

32.12.6 Live Parts Unguarded

Wall receptacles shall 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.

32.12.7 Power Control Switches

All office equipment shall be provided with on/off switches to control the electrical power.

32.12.8 Working on “Live Equipment” (Refer to Chapter 9 in Safety Manual)

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

32.13 Office Fire Prevention (Refer to Chapter 31 in Safety Manual)

The best time to think about fire safety is before a fire starts. Learn the location of fire escape routes and how to activate the fire alarm. Participate in practice fire drills on a regular basis. Become familiar with stairway exits.

Heat-producing equipment - copiers, word processors, microwave ovens, refrigerators, electrical space heaters, and coffee makers - are often overlooked as a potential fire hazard. 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 UL listed appliances plugged into grounded outlets (three prong plugs).

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.

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Do not allow combustible material (boxes, paper, etc.) to build up in appropriate storage locations (near sources of ignition).

32.13.1 Reporting Injuries, Emergencies, and Close Calls: (Refer to Chapter 21 in Safety Manual)

The initial response by personnel in the area when a mishap occurs is very critical. If person(s) are involved in a mishap, the first priority is to get assistance by calling 911 on a NASA phone or by pulling the nearest manual fire alarm box. From cell phone or pay phone dial (216) 433-8888 at Lewis Field or (419) 621-3222 at Plum Brook Station. The current Emergency Preparedness Plan can be found at <http://security.grc.nasa.gov/epp/epp.asp>

When an incident occurs, any of a number of people and organizations may have initial information about the case. Each NASA and contractor employee on NASA property or custodian of NASA assets elsewhere, is responsible for reporting mishaps and close calls within 24 hours using the Quick Incident Button in the Incident Reporting Information System (IRIS).

Employees may report safety and injury/illness concerns without possessing an IRIS user account. This capability (which includes an anonymous reporting option) helps ensure that all incidents are entered into the system in a timely fashion and thoroughly investigated.

32.13.2 Building Emergency Evacuation Procedures (Refer to Chapter 27 in Safety Manual)

- a. Know the evacuation procedure applicable to your work area to ensure individual safety in the event of an emergency. Know the location of fire alarm pull boxes.
- b. When evacuation alarm sounds immediately evacuate the building, assisting visitors, interns, etc., along the approved evacuation routes to a safe area. Do not use elevators. Do not lock office doors.
- c. Stay in designated areas until told to report to a shelter area or until told that the building is safe to re-enter by the Glenn Incident Commander.
- d. Maintain clean and unobstructed egress routes.

32.13.3 Bomb Threats

For telephonic bomb threats, record as much information about the call as possible using the form on the back page of the GRC Phone Book. You can also find the form in the Glenn Online Phonebook found at: <http://phonebook.grc.nasa.gov/>.

Report all bomb threats to the Glenn Security Management and Safeguards Office (SMSO), dial 911 during working and non-duty hours.

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If evacuation is ordered, quickly and calmly observe your area or space for suspicious or strange articles. Describe the article and its location to security or safety personnel.

32.14 Bibliography

- NPR 8715.3 NASA Safety Manual
- GRC at Lewis Field and Plum Brook Station, Environmental, Health, and Safety Pocket Guide
- Office of Health and Safety, Centers for Disease Control and Prevention