

FACILITY SAFETY

Introduction, Facility Guidelines: Institute, Administrative Area Safety, Slip, Trip, and Fall Prevention, Safety Signs, Colors and Marking Requirements, Tool Safety, Electrical Safety, Control of Hazardous Energy, Landscape and Ground Maintenance, Fleet and Vehicle Safety.

4. INTRODUCTION

P1

Hazards of all types can exist in healthcare facilities and organizations must take steps to identify and control these hazards. Facility personnel at all levels should learn to observe hazards and behaviors that could contribute to accidents. This chapter is about categories of risk, new requirements on emergency management, facility security, and information-related technology and communication systems.

4.1 FACILITY GUIDELINES INSTITUTE

P2

- Facility Guidelines Institute (FGI) is a non-profit organization that was established in 1998 to provide leadership and continuity to the development and publication of the Guidelines for Design and Construction of Health Care Facilities.
- FGI functions as a contractual, fundraising, and coordinating entity for the quad-annual Guidelines revision process, supporting the work of the independent Health Guidelines Revision Committee in its goal to update and improve the content of the Guidelines document.
- The 2014 Guidelines documents were produced with the participation of more than 200 experts in planning, design and construction, and operation of hospitals, outpatient facilities, and residential health, care, and support facilities.
- The Guidelines revision cycle brings together some of the best minds in our business and through a formal consensus process develops a series of minimum design and construction standards for adoption by federal, state, and private enforcing authorities.
- So, although called guidelines, the standards contained in the two documents are truly considered the standard of care for new construction and major renovation projects.
- The 2014 Guidelines will require a safety risk assessment (SRA) that includes an overarching risk identification process, with considerations for infection control, patient handling, falls, medication safety, psychiatric injury, immobility, and security.
- The 2014 FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities includes new requirements for assessing medication safety risks and identifying and designing medication safety zones to help health-care organizations.

4.2 ADMINISTRATIVE AREA SAFETY

P3

- Many healthcare organizations overlook the administrative areas during safety surveys.
- These areas contain a number of hazards including lifting, climbing, repetitive motions, tripping, and electrical.
- Office areas can also experience workplace violence in locations such as admissions, emergency departments, gift shops, patient affairs, and business offices.

4.3 SLIP, TRIP, AND FALL PREVENTION**P4**

- OSHA 29 CFR 1910.22, Walking/Working Surfaces, and ANSI A1264.2-2006, Provision for the Slip Resistance on Walking/Working Surfaces, provide guidance on preventing slips, trips, and falls.
- Safety personnel must identify, evaluate, and correct any hazards that could contribute to these types of events.
- Educate staff members about the causal and behavioral aspects of fall prevention efforts.
- Establish procedures to analyze trends related to slip and fall incidents.
- Slip, trip, and fall incidents can frequently result in serious disabling injuries.
- Slips and falls can result in lost workdays, reduced productivity, expensive worker compensation claims, and diminished ability to care for patients.

Eg:

- In 2009, the BLS reported a hospital incidence rate of 38.2 per 10,000 employees for same level slips, trips, and falls. The rate was 90% greater than the average rate for all other private industries combined. These events resulted most often in sprains, strains, dislocations, and tears for healthcare personnel.
- Contaminants on the floor contribute to most healthcare facility slip, trip, and fall incidents.
- Implementing effective housekeeping procedures, conducting proper floor cleaning, using walk-off mats, posting safety signs, and requiring the wearing of slip-resistant shoes minimize the risk of slipping.
- Many slip and trip hazards exist in food preparation and service areas, decontamination areas, near soap dispensers, at drinking fountains, and at building entrances. Encourage personnel to cover, clean, and promptly report all spills or floor hazards.
- Hang or place spill clean-up materials, paper towel holders, and pop-up tent wet floor signs in convenient locations throughout the healthcare facility.
- Use water-absorbent and flat bevelled edge walk-off mats at all locations water, ice, or soap may drip onto floors.
- Provide umbrella bags near entrances. Use proper cleaning procedures and ensure that cleaning products meet floor surface requirements.
- Mix cleaning products according to manufacturer directions and in the proper locations.
- Prevent entry into wet areas and use highly visible caution signs to inform employees and visitors of the hazard.
- Ensure the use of wet floor signs of 34–36 in. in height to ensure greater visibility.
- Rope or block off areas during floor cleaning, stripping, and waxing operations.
- Use barrier products or caution tape to prevent people from entering areas undergoing cleaning.
- Remove floor signs immediately once the floor dries. Wet floor signs can create familiar hazards if not removed.
- Ensure the proper alignment of all water pipes, floor drains, and down spouts.
- Use yellow safety warning paint to create visual cues to highlight changes in walkway elevations.

- Replace smooth flooring materials in areas normally exposed to water, grease, and particulate matter with rougher surfaced flooring when renovating or replacing floor surfaces.
- Identify and correct outside walking areas with hazards such as protruding structures, holes, rocks, and other types of debris that could contribute to falls.
- Never use concrete wheel stops in parking lots since they pose great tripping hazards.
- Develop procedures that direct the prompt removal of ice and snow from parking lots, garages, and side-walks.
- Place labelled bins filled with ice-melting materials and scoops that anyone can use immediately on icy patches.
- Provide SDS and instructions for handling all ice-melting chemicals.

4.3.1 Poor Lighting, Stairs and Handrails

- Proper lighting allows individuals to see their surroundings and notice unsafe conditions.
- Install lights in poorly lit areas and always use lights with the appropriate brightness.
- Proper construction and maintenance of stairs and handrails can reduce tripping hazards.
- Poorly designed stairs can lead to missteps and can cause trips and falls.
- Paint surfaces with **“safety yellow or other highly contrasted paint.”**
- Highlighting the edge steps to provide guidance related to a change in elevation.
- Keep stairs free of ice, snow, water, and other slippery contaminants.
- Ensure the installation of adequate lighting in all stairwells.
- Evaluate the need to install handrails at locations with less than four steps, locations such as employee shuttle bus stops, building entrances, or conference theatres.
- Use handrails of 34–38 in as measured from the stepping surface.
- Handrails must extend the full length of the stairs and extend 12 in at the top.
- For stairs greater than 44 in wide, install two handrails.
- For stairs less than 44 in. wide, provide one handrail on the right side of the stairway.

4.3.2 Hazard Identification and Reporting

- Conduct regular walking tours using a well-written slip, trip and fall prevention checklist to guide the identification of hazards.
- Correct all identified hazards immediately.
- Educate all healthcare facility on how to recognize slip, trip, and fall hazards.
- Encourage facility personnel to participate in developing slip and fall prevention strategies.
- Review facility historical accident and injury records to assist in identifying slip, trip, and fall hazards.
- Establish written housekeeping procedures immediately after reviewing.
- Incorporate slip, trip, and fall prevention education into recurring safety training.
- Conduct awareness campaigns to educate employees about the risk of slips, trips, and falls.
- Provide feedback on the actions taken to prevent slip, trip, and fall injuries.

4.3.3 Static Coefficient of Friction

- Static coefficient of friction (SCOF) relates to the traction between a person's foot or shoe sole and the walking surface.
- We can define SCOF as the relative force that resists the tendency of the shoe or foot to slide along a walkway surface.
- ADA recommends a minimum of 0.6 on level walking surfaces and 0.8 on ramps. OSHA requires an SCOF 0.5 in all areas.
- Slip resistance relates to a combination of factors including type of surface, and care and maintenance procedures with the presence of foreign materials between the foot/shoe sole and the walking surface.
- The AIA's Academy of Architecture for Healthcare states that "floor materials shall be readily cleanable and appropriate for each location."
- Install water-resistant floors in all food preparation areas and in locations containing baths or showers.
- Healthcare facilities must conform to a certain standard of care for flooring and protect people from unreasonable risks.
- Failure to conform to a reasonable standard of care can create liability issues.
- Negligence can involve any reasonable, close, or contributing causal factor as related to conduct and an injury.

Factors to Consider When Selecting New Flooring Materials

- Performance factors in wet and dry conditions.
- Consider durability of a surface as important in high traffic areas.
- Abrasion resistance simply means how long will the surface retain its slip resistance.
- Establish maintenance and care procedures to meet manufacturer specifications.
- Impact-resistant flooring also considers the weight of heavy loads.
- Make appearance important but not as crucial as safety.
- Most modern flooring will retain a good appearance if maintained properly.

4.4 SAFETY SIGNS, COLORS and MARKING REQUIREMENTS

P5

- OSHA Standard 29CFR1910.145 addresses accident prevention signs and tags.
- These specifications apply to the design, application and use of signs/symbols used to prevent accidental injuries or property damage.
- These specifications do not cover plant bulletin boards, safety posters, or any signs designed for streets, highways, railroads, or marine applications.
- OSHA standards do not address sign design for danger, caution, and safety instruction signs except for purpose and colors.
- OSHA requires signs designed with rounded or blunt corners and must be free from sharp edges, burrs, splinters, or other sharp projections because the ends or heads of fastening devices cannot create a hazard.
- The size of the sign, height and width of the letters, and viewing distances must meet ANSI Z535.2 requirements.
- Ensure that signs contain concise and easy to read wording.

- Use letters large enough to meet determined intended viewing distances.
- Place signs in locations to ensure individuals can take action to avoid the hazard.
- Use legible signs that do not cause distraction or create a hazard.
- Never place signs on moveable objects or adjacent to moveable objects such as doors.
- If necessary, equip signs with emergency or battery-operated illumination.
- OSHA Standard 29 CFR 1910.144 requires the use of red to mark fire protection equipment and apparatus.
- Use red danger markings for safety cans or other portable containers of flammable liquids, excluding shipping containers.
- Red safety cans must contain some additional clearly visible identification either in the form of a yellow band around the can or the name of the contents conspicuously stencilled or painted on the can in accordance with 1910.1200.
- OSHA mandates the use of yellow as basic color for designating caution.
- Use yellow for the marking of physical hazards such as striking against, stumbling, falling, and getting caught in-between.

ANSI Standards on Color Codes and Signs

- Z353.1 Color Codes for Safety Signs
- Z353.2 Environmental and Facility Safety Signs
- Z353.3 Safety Symbols
- Z353.4 Product Safety Signs and Labels
- Z353.5 Temporary Hazard Signs

OSHA Classifications of Signs

- **Danger signs:** indicates immediate danger and that special precaution are necessary. OSHA also specifies the use of red, black, and white colors for danger signs to meet the requirements of ANSI Z53.1.
- **Caution signs:** warns against potential hazards or caution against unsafe practices. OSHA specifies that caution signs possess a yellow background black panel and yellow letters. All letters used against the yellow background shall be black. The Colors must meet requirements of ANSI Z53.1.
- **Safety instruction signs:** use when there exists a need for general instructions and suggestions relative to safety measures. OSHA specifies that the standard color for safety instruction signs shall be a white background, green panel, and white letters. Any letters used on the white background shall be black. The colors must meet requirements of ANSI Z53.1.

Signs Classified by ANSI Z535.2-2002

- **Danger:** indicates immediately hazardous situations that could result in death or serious injury.
- **Warning:** indicates potentially hazardous situations that could result in death or serious injury.

- **Caution:** indicates potentially hazardous situations that may result in minor or moderate injury.
- **Notice:** indicates policy positions that relate directly or indirectly to the safety of personnel or protection of property.
- **General Safety:** indicates general instructions relative to safe work practices, reminders of proper procedures, and the location of safety equipment.
- **Fire Safety:** indicates locations of emergency fire-fighting equipment.
- **Directional Arrow Signs, Special Signs**

4.4.1 OSHA/ANSI Requirements for Marking Hazards Compressed gas cylinders (29 CFR 1910.253)

- Label the contents of the cylinder either by the chemical or trade name use stenciling or stamping on the shoulder of the cylinder.

Confined spaces (29 CFR 1910.146)

- Identify all workplace confined spaces and use danger signs or other effective means of identifying their locations and the dangers they pose.

Eyewash/shower stations (ANSI Z358.2-2004)

- Identify the locations of eyewashes and showers facilities.

Hazardous chemicals (29 CFR 1910.1200)

- Ensure that containers contain appropriate labels and warnings.

Hazardous waste (40 CFR Part 262)

- Facilities accumulating hazardous waste on site must label containers as Hazardous Waste and include the accumulation start date.
- Label transport to meet DOT requirements.

High voltage (29 CFR 1910.305)

- Permanently mark high voltage on the outside covers of pull and junction boxes.

Ladders (29 CFR 1910.25)

- Mark defective ladders taken out of service as Dangerous: Do Not Use.

Lockout/tag out (29 CFR 1910.147)

- Standardize lockout and tag-out devices within a facility in terms of size, color, shape, print, and format.
- Tag-out devices also need to warn against hazardous conditions of energized equipment. Appropriate legends on the tag-out devices include: Do Not Start, Do Not Open, Do Not Operate, Do Not Close, and Do Not Energize.

Machine guarding—Radial Saws (29 CFR 1910.213)

- Mark the direction of rotation on the hood.
- Additionally, place a permanent label, at least 1½ in. by ¾ in. at the rear of the guard that reads Danger: Do not rip or plough from this end.

Permanent aisles and passageways (29 CFR 1910.176)

- Allow sufficient clearances for mechanical equipment handling, loading docks, and doorways.
- Clearly mark such passageways.
- Use striped or solid floor tapes to mark off such areas. The color of tape used depends on degree of hazard.

Pipe markings (ANSI/ASME A13.1)

- ANSI requires marking of pipes using legend indicating the name of the contents and arrows showing the direction of flow of the material.
- Use a color in combination with the legend to identify the characteristic hazards of the contents.
- Apply labels on or near valves, flanges, branches, changes in direction, and wherever pipes pass through walls.

Radiation hazards (29 CFR 1910.96)

- Post signs or labels bearing the radiation caution symbol in radiation areas and on containers of radioactive material.
- These sign or labels require specific wording depending on the situation.

Respirator storage (29 CFR 1910.134)

- Clearly identify storage compartments for respirators at workstations and those used for emergencies.
- Storage rooms for flammable and combustible materials (29 CFR 1910.106).
- Mark an aisle at least 3ft wide in every inside storage room.

4.5 TOOL SAFETY**P6**

- Organizations must take steps to identify and help people avoid tool-related hazards.
- In the process of removing or avoiding the hazards, workers must learn to recognize the hazards associated with the different types of tools and the safety precautions necessary to prevent those hazards.
- Employees using hand and power tools can experience hazards such as falling, flying, abrasive, and splashing objects.
- Other exposures can include harmful dusts, fumes, mists, vapors or gases.
- Hand tools may include anything from axes to wrenches.
- The greatest hazards posed by hand tools result from misuse and improper maintenance.
- The employer and workers must take actions to keep tools and equipment in good working order.

- Employers should caution employees to keep saw blades, knives, and other tools away from aisle areas and other employees working in close proximity.
- The use of appropriate PPE can help protect workers against tool hazards.
- Power tool comes in a variety of types based on the power source they use.
- Power tools can include those powered by electric, pneumatic, liquid fuel, hydraulic, and powder-actuated sources.
- Never carry a tool by the cord or hose and never yank the cord or the hose to disconnect.
- Keep cords and hoses away from heat, oil, and sharp edges. Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits, and cutters.
- Keep all observers at a safe distance away from the work area. Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting.
- Workers should never hold a finger on the switch button while carrying a plugged-in tool.
- Follow instructions in the user's manual for lubricating and changing accessories. Prohibit the wear of loose clothing, ties, or jewellery that can get caught in moving parts.
- Remove from service-damaged portable electric tools and tag *Do Not Use*.
- Safeguard hazardous moving parts such as belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, and chains.
- Take precautions against reciprocating, rotating, or moving parts of equipment if exposed.
- Never remove safety guards when using a tool.
- Use only hand-held powered tools equipped with a momentary contact *on-off* control switches.
- Some tools also may contain a lock-on control that turns off with a single motion of the same finger or fingers that turn it on.
- Key hazards of electric-powered tools include burns and slight shocks that can lead to injuries or heart failure.
- To protect users from shock, tools must contain a three-wire cord with a proper ground.
- Tools can also contain double insulation or powered by a low-voltage isolation transformer.
- Operate electric tools within their design limitations. Recommend use of gloves and safety footwear when using electric tools.
- Never use electric tools in damp or wet locations. Keep work areas well lighted.
- Pneumatic tools, powered by compressed air, can include chippers, drills, hammers, and sanders.
- Key hazards include getting hit by a tool attachment or by a fastener used with the tool.
- Recommend use of eye and face protection when working with pneumatic tools.
- Working with noisy tools such as jackhammers requires proper and effective use of hearing protection.
- When using pneumatic tools, ensure secure fastening to the hose to prevent them from becoming disconnected.

- A short wire or positive locking device attached to the air hose can serve as an added safe-guard.
- A safety clip or retainer can prevent attachments such as chisels on a chipping hammer from being unintentionally shot from the barrel.
- Powder-actuated tools operate like a loaded gun.
- Treat them with respect and take precautions.
- Specially trained employees should operate these tools.
- Never use these tools in an explosive or flammable atmosphere.
- Before using, inspect the tools to determine cleanliness and ensure that moving parts operate freely and the barrel contains no obstructions.
- Never point the tool at someone else.
- Always load the tool immediately before using.
- Never leave a loaded tool unattended.
- Tools must operate until pressed against the work surface with a force of at least 5 lb greater than the total weight of the tool.
- If a powder-actuated tool misfires, the employee should wait at least 30 s and fire again. If it still will not fire, the user should wait another 30 s before removing the faulty cartridge.
- Place the bad cartridge in water. Wear appropriate eye and face protection when using a powder-actuated tool.
- When using hydraulic power tools, use approved fire-resistant fluids that will retain operating characteristics at the most extreme temperatures.
- Never exceed the manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings.
- Ensure that all lever and ratchet jacks, screw jacks, and hydraulic jacks contain a device that stops them from jacking up too high.
- Mark the manufacturer's load limit in a prominent place on the jack. Never use a jack to support a lifted load.

4.6 ELECTRICAL SAFETY (29 CFR SUBPART S)

P7

- Electricians and maintenance personnel must understand the OSHA electrical safety standards published in 29 CFR 1910.301–399.
- Electrical installations and utilization equipment must follow the requirements to every replacement, installation, or utilization of electrical equipment.
- Supervisors must inspect work areas for possible electrical hazards.
- Use Insulators prevent the flow of electricity.
- Water that contains impurities such as salts and acids make a ready conductor.
- Electrical equipment can cause shock, electrocution, and catastrophic property damage due to fire or explosion risks.
- Electrical fires in healthcare facilities many times result from short circuits, overheating equipment, and failure of current safety devices.
- Explosions may occur when flammable liquids, gases, and dusts interact with ignition sources generated by electrical equipment.

4.6.1 Grounding

- Ground the frames of all electrical equipment regardless of voltage.
- Ground exposed noncurrent-carrying metal parts of electrical equipment that may become energized under abnormal conditions.
- Cover all electrical outlets, switches, and junction boxes.
- Provide ground fault circuit interrupters
- The OSHA Standard 29 CFR 1910, Subpart S, covers two types of grounds.
- The grounded neutral conductor normally the white or gray protects machines, tools, and insulation against damage.
- This additional ground offers enhanced protection for the worker by providing another path from the machine or tool through which the current flows into the ground.
- This protects the worker should the metal frame of the tool become accidentally energized.
- The resulting heavy surge of current will activate the circuit protection devices and open the circuit.

4.6.2 Circuit Protection Devices

- Circuit protection devices limit or shut off the flow of electricity in the event of a ground fault over- load or short circuit in the wiring system.
- Fuses and circuit breakers primarily protect equipment and conductors.
- Use in wet locations and construction areas.
- Employers must ensure that workers understand safety-related work practices.
- Workers whose jobs require them to work constantly and directly with electricity must use required PPE.
- Equipment may consist of rubber insulating gloves, hood, sleeves, line hose, and protective helmet.
- Workers should always use tools designed to withstand voltage and stresses of electricity.

4.6.3 Work Practices

- Use safety-related work practice to help prevent electrical shock or injuries.
- Workers should be away from energized equipment or circuits.
- Train qualified personnel on the correct procedures to use when working on energized equipment or circuits.
- Prior to using or performing maintenance on electrical equipment, first determine the safety of equipment location.
- Look for damp and wet hazards, high temperatures, and flammable liquids and gases.
- Ensure that current and safety devices such as fuses, breakers, and GFCI are working correctly.
- Check power cords and plugs for defects.
- Look for cuts in the insulation that expose bare wires.
- Determine the location of any emergency shutoff switch before using a piece of equipment.

- Ensure that sufficient space exists around the electrical equipment or circuit in order to maintain or operate it safely.
- Personnel must remove personal metal jewellery.
- De-energize electrical equipment before testing or repairing in accordance with the OSHA Lockout Tag-out Standard 29 CFR 1910.147.
- If de-energizing electrical equipment or circuits increases the potential of an electrical hazard or requires troubleshooting, use appropriate tools and PPE as mandated by the situation.

4.6.4 Electrical Shock

- Shock normally occurs when a person contacts both wires of an electrical circuit, comes into contact with one wire of an energized circuit and the ground, or makes contact with a hot metallic energized part when in contact with the ground.
- Several factors impact the severity of shock including the (1) amount of current (amperes) flowing through the body, (2) path of the current through the body, (3) length of time the person remain in the circuit, (4) phase of the heart cycle when the shock occurs, and (5) general health of the person involved.
- Severe shock can cause falls, cuts, burns, and broken bones.
- Three types of burns can result from shocks.
- Electrical burns result from current flowing through tissue or bone.
- Thermal burns occur when the skin comes into contact with the hot surfaces of overheated conductors or other energized parts.
- Electrical arc burns result from high temperatures occurring near the body.

4.7 CONTROL OF HAZARDOUS ENERGY (29 CFR 1910.147)

- Lockout procedures exist to render inoperative electrical systems, pumps, pipelines, valves, and any other systems that could energize while employees work.
- The OSHA Standard 29 CFR 1910.147 places four basic requirements on employers with worker engaged in service or maintenance functions: (1) written procedures for lockout/tag out, (2) training of employees, (3) accountability of engaged employees, and (4) administrative controls.
- Before beginning service or maintenance, ensure accomplishment of the proper steps according to the specific provisions of the employer's energy control procedure.
- Designate lockout employees to work on any de-energized machinery.
- All employees must learn to respect lockout and tag-out devices.
- Mandate that the person who applied these devices is the only authorized individual that can remove them.
- Training must ensure that employees understand the purpose, function, and restrictions of the energy control procedures.

4.7.1 Authorized Employees

- Employers must provide training specific to the needs of authorized, affected, and other employees.

- Consider authorized employees as those responsible for implementing the energy control procedures or performing the service or maintenance activities.
- They need the knowledge and skills necessary for the safe application, use, and removal of energy isolating devices.
- They also need training in the following areas: (1) hazardous energy source recognition, (2) type and magnitude of the hazardous energy sources in the workplace, (3) energy control procedures, and (4) means or methods to isolate and control the energy sources.

4.7.2 Affected Employees

- Affected employees must receive training on the purpose and use of energy control procedures.
- These employees must (1) recognize the use energy control procedures, (2) understand the purpose of the procedure, (3) never tamper with lockout/tag-out devices, and (4) use equipment under lockout or that contains tag.
- Other employees working or near energy control areas must receive instructions about the energy control procedures.
- This includes education about the prohibition of removing a lockout or tag-out device and attempting to restart, reenergize, or operate the machinery.
- The employer must provide initial training before starting service/maintenance activities and must provide training as necessary.
- In addition, the employer must certify that the training of all employees is covered by the standard.
- The certification must contain each employee's name and dates of training.
- Employers must provide retraining for all authorized and affected employees and a change occurs in the following: (1) job assignments, (2) machinery or processes, (3) presence of a new hazard, and (4) revised energy control procedures.

4.7.3 Periodic Inspection and Reviews

- Inspections ensure that employees understand their responsibilities under the procedure and can implement energy control procedures properly.
- Employers must ensure that an authorized inspector, not involved in the particular control procedure under evaluation, determines the following: (1) employees followed correct steps in the energy control procedures, (2) employees know their responsibilities, and (3) the procedure used to provide necessary protections.
- For lockout procedures, the periodic inspection must include a review of each authorized employee's responsibilities.
- The inspector's review can extend to affected employees.

4.7.4 Maintenance

- Production equipment and machines fall under the safeguarding requirements of 29 CFR, Subpart O.
- OSHA requires the employer to conduct periodic inspections and ensure adherence to following proper procedures or requirements.

- This periodic inspection includes a review of each authorized worker's responsibilities under the energy control procedures.
- The inspections and the reviews provide a representative sample of compliance with the requirements of the standard and not a 100% inspection.

4.7.5 Tag-Out Devices

- Tags affixed to energy isolating devices serve as warning devices only and do not provide any type of physical restraint.
- Never permit the removal of any tag attached to an energy isolating device without authorization of the person attaching it.
- Never bypass, ignore, or otherwise defeat the use of tag-out processes.
- Ensure that all tags remain legible and understandable.
- Use tags made of materials that will withstand the environmental conditions encountered in the workplace.
- When utilized, attach tags securely to energy isolating devices so that they will not come loose during use.
- Use tag- out devices substantial enough to prevent inadvertent or accidental removal.
- Tag-out devices must warn against hazardous conditions if the machine or equipment becomes energized.
- Devices must communicate as an appropriate warning such as the following:
- DO NOT START, DO NOT ENERGIZE, DO NOT OPEN, DO NOT OPERATE, DO NOT CLOSE

4.7.6 Lockout Devices

- Lockout devices and practices vary by nature and function.
- Recommend the use of key-operated padlocks assigned to specific individuals.
- Multiple lock adapters will enable more than one worker to place their own padlock on the isolating device to guarantee that the machine or equipment will remain deactivated
- Use chains or other commercially available devices to prevent valves from being opened
- Operations requiring lockout by more than a single employee should use multiple lock adapters.
- Safely release any stored energy before the start of maintenance or installation work.
- Please note that locking and tagging on/ off switches often do not prevent accidental start-up or prevent voltage from being present in the equipment.

4.7.7 Training

- Providing training helps all employees to understand the purpose and function of the lockout/tag- out procedures.
- Workers must demonstrate that they possess the knowledge and skills for safe application, usage, and removal of energy controls.
- Personnel who work around electrical equipment must focus on the hazards of electricity and the proper observation precautions.

- Each authorized employee who will use a lockout/tag-out procedure must receive training in the recognition of applicable hazardous energy sources
- Conduct retraining as necessary whenever a periodic inspection reveals or an employer believes that shortcomings exist in an employee's knowledge.
- Employers must review their procedures at least once a year to ensure that workers remain protected.
- As part of the review, employers must correct any deviations and inadequacies identified in the energy control procedure or its application.

4.8 LANDSCAPE AND GROUNDS MAINTENANCE

P8

- The employees responsible for grounds keeping stay alert and watch for the unexpected.
- The following safety tips may help avoid accidents and injuries to employees.
 - Ensure that workers properly wear PPE.
 - Face shields or goggles to protect eyes from dust and flying particles.
 - Wraparound sunglasses with UVA and UVB protection can reduce the risk of cataracts from sun exposure.
 - Provide appropriate hearing protection devices such as earmuffs or ear plugs when noise exceeds OSHA requirements.
 - Require the use of proper respiratory protection for extremely dusty conditions or when applying pesticides.
 - Provide appropriate head protection for individuals working under low branches or where falling object hazards exist.
- Provide education and training that covers all equipment and tools used.
- Ensure that workers know how to operate the controls and use the equipment safely.
- Inspect equipment carefully for loose, broken, or damaged parts.
- Ensure grounding of electrically operated equipment.
- Teach workers to inspect areas for potential hazards and remove all debris from the area.
- Never allow employees to operate gasoline or diesel equipment inside a building.
- Groundskeepers use various types of equipment while performing their job tasks.
- Train and authorize each individual to operate specific equipment.

4.8.1 Blower Safety

- Start and run the equipment in an upright position.
- Operate the blower with tubing attached and direct the discharge of debris away from people, animals, glass, and solid objects that could cause material to ricochet.
- Never use blowers while on elevated or unstable surfaces.
- Never use blowers to apply pesticides, fertilizers, or other toxic substances.

4.8.2 Edger Safety

- Require disengagement of the blade before starting the engine.
- Train workers to hold the edger with both hands comfortably.
- Instruct individuals to keep hands and feet well clear of the cutter blade.

- Watch the discharge direction carefully and direct it away from people, animals, children, and windows.
- Disengage and stop the engine before adjusting or repairing.

4.8.3 Chain Saw Safety

- When operating chainsaws, the use of PPE, effective training, and understanding the proper cutting technique remain the keys to preventing injuries.
- Most chain saw injuries involve contact with the cutting chain that can result in severe injury to the hands, legs, feet, and head.

4.8.4 Trimmer Safety

- Use only trimmers with the cutting teeth and guards close enough together to prevent fingers from fitting between them.
- Select trimmers with two handles, including a wide forward handle high above the cutting blade.
- Lightweight models are handled much easier than heavier ones.
- Never operate trimmer above chest height and keep hands and body away from the blades.
- Keep the cord of electric models away from the trimmer to avoid damage or cuts to the cord.
- Stop the engine or unplug electric models before cleaning or adjusting.

4.8.5 Push Mower

- Never take a running mower over gravel, stones, or hard objects such as pipes, rocks, or sidewalks.
- Never pull, always push the mower forward.
- Ensure the correct positioning of safety devices.
- Ensure dryness of the grass before beginning.
- Disconnect the spark plug wire before attempting service, adjustment, or repair of the mower.

4.8.6 Riding Mower Safety

- Ensure that all riding mowers contain a working engine interlock and dead man controls.
- Disengage both the mower and transmission before starting the engine.
- Drive the mower up and down gentle slopes for stability.
- Turn off the engine and wait for moving parts to stop before dismounting and always remove the key.
- Slow down when turning sharply and on slopes to avoid tipping.
- Keep the discharge chute pointed away from buildings, people, and animals.

4.9 FLEET AND VEHICLE SAFETY

P9

- Healthcare organizations with fleet or driver safety functions must make driver selection and qualification critical to success.

- Ensure that each applicant that will operate a motor vehicle completes a release to permit the company to obtain their formal driving records from the state Department of Motor Vehicles.
- Conduct substance abuse testing, check all references, and provide training sessions.
- Many insurance carriers provide training on fleet safety.
- They normally train the trainer who then will conduct sessions for drivers.
- Some safety councils provide training sessions and even specialized training classes.
- The effective supervision of drivers poses the greatest challenge to any fleet manager.
- Publish driver policies in writing and ensure wide dissemination.
- NIOSH established the Center for Motor Vehicle Safety (NCMVS) in 2010 to promote research related to preventing motor vehicle crashes.
- NIOSH focuses on the use of occupant restraints, driver fatigue, vehicle design, work organizational factors, and employer policies.
- NIOSH hopes to develop injury prevention strategies and transfer the information into workplaces.

4.9.1 Safe Practices For Motor Vehicle Operations (ANSI/ASSE Z15.1 Standard)

- ANSI/ASSE Z15.1 provides organizations with a guidance document to assist with the development of policies and procedures necessary to control risks related to the operation of motor vehicles.
- The standard applies to the operation of organization-owned or organization-leased vehicles on public roads.
- Motor vehicle practices and operations play a vital role on the effectiveness of any overall safety and health management function.
- The new publication places added emphasis on restraint systems, impaired driving, aggressive driving, distracted driving, journey management, and fatigue management.
- ANSI Z15.1 also places an increased emphasis on the vehicle acquisition, inspection, and maintenance.
- The standard recommends that organizations develop written motor vehicle safety policies to meet organizational needs.

4.9.2 Major Fleet Safety Components

- **Management support:** Leaders provide the direction for safety efforts. The development of a safety policy by senior management should address the expectations of all drivers.
- **Driver selection and qualification:** Ensure that the applicant understands the job requirements and expectations including any physical qualifications for the position. Ensure that the applicant meets all mandatory and legal requirements. Investigate any gaps in employment. Ensure that each applicant completes a formal application and signs a release to permit the company to obtain their driving records from the Department of Motor Vehicles.
- **Driver training:** Driver training can take several forms. Many insurance carriers provide training to the fleet or safety managers. In effect, they train the trainer, who in turn trains the drivers. Some carriers offer training referred to as commentary class. The driver

spends time in a classroom setting and then applies the concepts learned to a real-life road test. The trainer sits in the passenger seat with a scorecard and takes notes to make sure the trainee is verbalizing appropriate defensive driving decisions. Some safety councils provide training sessions and even specialized training classes.

- **Supervision:** The effective supervision of drivers poses the greatest challenge to the fleet manager. The information reported can be used to determine trends or document multiple reports on the same driver.
- **Vehicle maintenance:** Some experts indicate that about 90% of accident investigations reveal that a human serves as one of the primary causes. Proper vehicle maintenance and documentation is critical. Drivers must use a vehicle inspection checklist and do a daily inspection. Fleet repair shops must employ qualified mechanics that conduct periodic maintenance.
- **Accident investigation:** Organizations must conduct proper investigations to permit analysis of all accident events. This permits safety personnel to document (1) lessons learned, (2) take actions to prevent future events, (3) improve training, and (4) discipline drivers not following procedures.

PART-A

1. What are the hazards of administrative area safety?

- These areas contain a number of hazards including lifting, climbing, repetitive motions, tripping, and electrical.

2. Give four hazards related to poor staircase

- Proper construction and maintenance of stairs and handrails can reduce tripping hazards.
- Poorly designed stairs can lead to missteps and can cause trips and falls.
- Paint surfaces with “**safety yellow or other highly contrasted paint.**”
- Highlighting the edge steps to provide guidance related to a change in elevation.

3. Abbreviation of SCOF

- Static Coefficient of Friction

4. What are the ANSI Standards on Color Codes and Signs

- Z353.1 Color Codes for Safety Signs
- Z353.2 Environmental and Facility Safety Signs
- Z353.3 Safety Symbols
- Z353.4 Product Safety Signs and Labels
- Z353.5 Temporary Hazard Signs

5. Tell about caution sign?

- **Caution signs:** warns against potential hazards or caution against unsafe practices. OSHA specifies that caution signs possess a yellow background black panel and yellow letters. All letters used against the yellow background shall be black. The Colors must meet requirements of ANSI Z53.1.

6. What are marking requirements of hazards?

- Eyewash/shower stations (ANSI Z358.2-2004)
- Hazardous chemicals (29 CFR 1910.1200)
- Hazardous waste (40 CFR Part 262)

7. How does tool safety makes humans safer durning working hours?

- The greatest hazards posed by hand tools result from misuse and improper maintenance.
- The use of appropriate PPE can help protect workers against tool hazards.
- Power tool comes in a variety of types based on the power source they use.
- Power tools can include those powered by electric, pneumatic, liquid fuel, hydraulic, and powder-actuated sources.
- Never carry a tool by the cord or hose and never yank the cord or the hose to disconnect.

8. List out the ways to protect from electrical appliances?

- Electrical installations and utilization equipment must follow the requirements to every replacement, installation, or utilization of electrical equipment.
- Supervisors must inspect work areas for possible electrical hazards.
- Use Insulators prevent the flow of electricity.
- Water that contains impurities such as salts and acids make a ready conductor.

9. Explain about three ways of burning after electrical shock?

- Three types of burns can result from shocks.
- Electrical burns result from current flowing through tissue or bone.
- Thermal burns occur when the skin comes into contact with the hot surfaces of overheated conductors or other energized parts.
- Electrical arc burns result from high temperatures occurring near the body.

10. What are the ways authorized employee implement training?

- hazardous energy source recognition,
- type and magnitude of the hazardous energy sources in the workplace,
- energy control procedures,
- methods to isolate and control the energy sources.

11. List out the four factors considered for affected employees?

- recognize the use energy control procedures,
- understand the purpose of the procedure,
- never tamper with lockout/tag-out devices,
- use equipment under lockout or that contains tag.

12. Define Tag-out devices?

- Tag-out devices must warn against hazardous conditions if the machine or equipment becomes energized.

13. What are the tag-out warning contains?

- Devices must communicate as an appropriate warning such as the following:
- DO NOT START,
- DO NOT ENERGIZE,
- DO NOT OPEN,
- DO NOT OPERATE,
- DO NOT CLOSE

14 .How does employee prevent accidents in ground maintenance?

- Ensure that workers properly wear PPE.
- Face shields or goggles to protect eyes from dust and flying particles.

- Wraparound sunglasses with UVA and UVB protection can reduce the risk of cataracts from sun exposure.
- Provide appropriate hearing protection devices such as earmuffs or ear plugs when noise exceeds OSHA requirements.
- Require the use of proper respiratory protection for extremely dusty conditions or when applying pesticides.
- Provide appropriate head protection for individuals working under low branches or where falling object hazards exist.

15. What are the four components in fleet and vehicle?

- Management support
- Driver selection and qualification
- Driver training:
- Supervision
- Vehicle maintenance:
- Accident investigation

16. Explain blower safety?

- Start and run the equipment in an upright position.
- Operate the blower with tubing attached and direct the discharge of debris away from people, animals, glass, and solid objects that could cause material to ricochet.
- Never use blowers while on elevated or unstable surfaces.
- Never use blowers to apply pesticides, fertilizers, or other toxic substances.

17. List out ways landscape and ground maintenance safety is provided?

- Blower Safety
- Edger Safety
- Chain Saw Safety
- Trimmer Safety
- Push Mower
- Riding Mower Safety

18. Why does retraining provided to affected employee?

- job assignments,
- machinery or processes,
- presence of a new hazard,
- revised energy control procedures.

19. What are the four requirements of employees in control hazardous energy?

- written procedures for lockout/tag out,
- training of employees,
- accountability of engaged employees,

- administrative controls.

20. List out the four reasons circuit protection devices?

- Fuses and circuit breakers primarily protect equipment and conductors.
- Use in wet locations and construction areas.
- Employers must ensure that workers understand safety-related work practices.
- Workers whose jobs require them to work constantly and directly with electricity must use required PPE.
- Equipment may consist of rubber insulating gloves, hood, sleeves, line hose, and protective helmet.

21. What is OSHA specification for respiratory protection and explain it?

Respirator storage (29 CFR 1910.134)

- Clearly identify storage compartments for respirators at workstations and those used for emergencies.
- Storage rooms for flammable and combustible materials (29 CFR 1910.106).
- Mark an aisle at least 3ft wide in every inside storage room.

22. Where does the pipe markings indicates?

Pipe markings (ANSI/ASME A13.1)

- ANSI requires marking of pipes using legend indicating the name of the contents and arrows showing the direction of flow of the material.
- Use a color in combination with the legend to identify the characteristic hazards of the contents.
- Apply labels on or near valves, flanges, branches, changes in direction, and wherever pipes pass through walls.

23. List out the Signs Classified by ANSI Z535.2-2002?

- Danger
- Warning
- Caution
- Notice
- General Safety
- Fire Safety
- Directional Arrow Signs,
- Special Signs

24. Explain administrative area safety with an example?

- In 2009, the BLS reported a hospital incidence rate of 38.2 per 10,000 employees for same level slips, trips, and falls. The rate was 90% greater than the average rate for all other private industries combined. These events resulted most often in sprains, strains, dislocations, and tears for healthcare personnel.

25. List out the functions of facility guidelines institute?

- FGI functions as a contractual, fundraising, and coordinating entity for the quad-annual Guidelines revision process, supporting the work of the independent Health Guidelines Revision Committee in its goal to update and improve the content of the Guidelines document.

26. Define slip resistance?

- Slip resistance relates to a combination of factors including type of surface, and care and maintenance procedures with the presence of foreign materials between the foot/shoe sole and the walking surface.

PART-B

1. List at least four changes made in the 2012 version of NFPA 99.
2. List two standards that address slip and trip hazards.
3. What should be the ideal height of a wet floor sign?
4. How many handrails should be present for stairs less than 44 in. wide?
5. Define the concept known as SCOF.
6. List at least five factors to consider when selecting new flooring materials.
7. What standard addresses the height and width of the letters found on safety signs?
8. What standards organization publishes the elevator safety code?
9. What is the maximum step spacing distance for ladders?
10. What organization publishes a standard that addresses reinforced plastic ladders?
11. List seven types of information that marked on ladders.
12. When working from a scaffold, what's the minimum working distance from electrical power lines?
13. List the two OSHA mandated options for guarding a skylight.
14. List the five basic rules for tool safety.
15. How does OSHA classify three basic areas requiring safeguarding of dangerous equipment?
16. List the seven elements of the hierarchy of guarding equipment.
17. List the two primary NFPA codes that contain special electrical requirements for healthcare facilities?
18. List the five factors that can affect shock severity.
19. List six electrical-related standards that would apply to healthcare facilities.
20. Describe the purpose of any lockout procedure.
21. List the five basic characteristics that could apply to a permit-required confined space.
22. Define the following noise-related terms:
 - Frequency
 - Amplitude
 - Decibel scale
23. List at least five pipe contents color schemes.
24. Define the following ventilation terms:
 - Anemometer
 - Capture velocity
 - Dilution ventilation
25. What percentage of all IAQ problems result from insufficient or ineffective ventilation?
26. Describe the basic OSHA training requirements for operators