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OSHA 10

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OSHA 10

Occupational Safety and Health Administration

Introduction to OSHA

OSHA :

- It is part of the US Department of Labor.
- The OSH Act covers most private sector employers and their workers.

OSHA Mission :

- With the Occupational Safety and Health Act of 1970, congress created the Occupational Safety and Health Administration (OSHA) to ensure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.

OSHA Mission :

- The mission of OSHA is to save lives, prevent injuries and protect the health of America's (all people) workers.
- Some of the things OSHA does to carry out this mission are : developing job safety and health standards and enforcing them through worksite inspections , maintaining a reporting and record keeping system to keep track of job-related injuries and illnesses, providing training programs to increase knowledge about occupational safety and health.

Rights under OSHA :

- A safe and healthful workplace
- Know about hazardous chemicals
- Information about injuries and illnesses in your workplace
- Complain or request hazard correction from employer
- Training
- Hazard exposure and medical records

Rights under OSHA :

- File a complaint
- Participate in inspection

OSHA Act :

- “ Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees “ .

What do OSHA Standards Say..? :

- OSHA standards fall into four categories : General industry, construction, maritime and Agriculture.
- OSHA issues standards for a wide variety of workplace hazards.
- Where there are no specific OSHA standards, employers must comply with The General Duty Clause, section 5(a).

Walking-Working Surfaces & Fall Protection Standards

Standards :

- Falls from heights and on the same level (a working surface) are among the leading causes of serious work related injuries and deaths.
- OSHA had issued a final rule on walking-working surfaces and personal fall protection systems to better protect workers in general industry from these hazards by updating and clarifying standards and adding training and inspection requirements.

Standards :

- The rule incorporates advances in technology, industry best practices and national consensus standards to provide cost effective and cost-efficient worker protection.
- It updates general industry standards addressing slip, trip, and fall hazards and adds requirements for personal fall protection systems.

Timeline :

- Installing personal fall arrest or ladder safety systems on new fixed ladders over 24 feet and/on replacement ladder/ladder sections, including fixed ladders on outdoor advertising structures (Nov, 2018).
- Ensuring existing fixed ladders over 24 feet, including those on outdoor advertising structures, are equipped with a cage, well, personal fall arrest system or ladder safety system (Nov, 2019)

Timeline :

- Replacing cages and wells (used as fall protection) with ladder safety or personal fall arrest systems on all fixed ladders over 24 feet (Nov, 2036).

Exit Routes, Emergency Action plans , Fire prevention plans & Fire protection

Plans & Protection :

- OSHA requires employers to provide proper exists, fire fighting equipment, and employee training to prevent fire deaths and injuries in the workplace.

Exit route :

- A continuous and unobstructed path of exit travel from any point within a workplace to a place of safety.
- It consists of three parts : exit access, exit , exit discharge.

Exit routes : basic requirements :

- Exit routes must be permanent and there must be enough exists in the proper arrangement for quick escape.
- Exists must be separated by fire-resistant materials.
- Openings into an exit must be limited to those necessary to allow access to the exit or to the exit discharge.
- An opening into an exit must be protected by an approved self closing fire door that remains closed or automatically closes in an emergency.

Exit discharge :

- Each exit discharge must lead directly outside or to a street, walkway, refuge area, public way or open space with access to the outside that is large enough to accomodate all building occupants likely to use the exit route.
- Exit stairs that continue beyond the level on which the exit discharge is located must be interrupted on that level by doors, partitions or other effective means that clearly indicate the direction of travel to the exit discharge.

Exit doors must be unlocked :

- Must be able to open from the inside at all times without keys, tools or special knowledge.
- Device such as panic bar that locks only from outside is permitted.
- Must be free of any device or alarm

Side-Hinged exit door ：

- Must be used to connect any room to an exit route.
- A door that connects any room to an exit route must swing out in the direction of exit travel if the room is designed to be occupied by more than 50 people or contains high hazard contents.
- Exit marking should be done.

Emergency action plan :

- Describes actions that must be taken to ensure employee safety in emergencies.
- Includes floor plans or maps which shows emergency escape routes.
- Tells employees what actions to take in emergency situations.
- Covers expected emergencies like fires, explosions, chemical releases etc.

Fire prevention plan must include ：

- A list of the major fire hazards and handling, storage and control procedures.
- Names or job titles of persons responsible for maintenance of equipment and systems to prevent or control ignitions or fires.
- Names or job titles of persons responsible for control of fuel source hazards.
- Training of all employees who have responsibilities in the plan.

Portable Fire extinguishers ：

- If portable fire extinguishers are provided for employee use, the employer must mount, locate and identify them so workers can access them without subjecting themselves to possible injury.

Electrical

Electrical Safety ：

- Working with electricity can be dangerous.
- OSHA's electrical standards are designed to protect employees exposed to dangers such as electric shock, electrocution, fires and explosions.
- It includes references that provide information related to electrical in construction including OSHA's electrical construction regulations, hazard recognition, possible solutions and additional resources.

Electrical Safety ：

Electrical hazards can cause burns, shocks and electrocution (death).

- Assume that all overhead wires are energized at lethal voltages. Never assume that a wire is safe to touch even if it is down or appears to be insulated.
- Never touch a fallen overhead power line. Call the electric utility company to report fallen electrical lines.

Electrical Safety ：

- Stay at least 3 meters away from overhead wires during cleanup and other activities. If working at heights or handling long objects, survey the area before starting work for the presence of overhead wires.
- If an overhead wire falls across your vehicle while you are driving, stay inside the vehicle and continue to drive away from the line.

Electrical Safety ：

- Never operate electrical equipment while you are standing in water.
- Never repair electrical cords or equipment unless qualified and authorized.
- Have a qualified electrician inspect electrical equipment that has gotten wet before energizing it.
- Always use caution when working near electricity.

Personal Protective Equipment

Personal Protective Equipment ：

- It is referred to as “PPE”.
- It is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses.
- These injuries and illnesses may result from contact with chemical, radiological, physical, electrical,mechanical or other workplace hazards.

Personal Protective Equipment ：

- PPE may include items such as gloves, safety glasses and shoes, earplugs and muffs, hard hats, respirators, full body suits etc.
- All PPE should be safely designed and constructed, and should be maintained in a clean and reliable manner.
- If the PPE does not fit properly, it can make the difference between being safely covered or dangerously exposed.

Requirements for PPE ：

- Performing a “hazard assessment” of the workplace to identify and control physical and health hazard.
- Identifying and providing appropriate PPE for employees.
- Training employees in the use and care of PPE.
- Employees should attend training sessions on PPE.
- Care for, clean and maintain PPE

The Hazard Assessment ：

- A first critical step in developing a comprehensive safety and health program is to identify physical and health hazards in the workplace.
- This process is known as “ health assessment” .
- The hazard assessment should begin with a walkthrough survey of the facility to develop a list of potential hazards in various categories.

The Hazard Assessment ：

- Categories include impact, penetration, chemical, heat/cold, harmful dust, light radiation and biological.

OSHA Assessment ：

- Safety and Health program management guidelines.
- State programs
- Consultation services
- Strategic partnership program
- Alliance program
- OSHA training and program

Hazard Communication

Hazard Communication Standard ：

- In order to ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be available and understable to workers.
- Chemical manufacturers and importers are required to evaluate the hazards of chemicals they produce or import, and prepare labels and safety data sheets to convey the hazard information to their downstream customers.

Hazard Communication Standard ：

- All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately.

Hazard Communication Standard Major changes ：

- Hazard classification : provides specific criteria for classification of health and physical hazards, as well as classification of workers.
- Labels : chemical manufacturers and importers will be required to provide a label that includes a harmonized signal word, pictogram , and hazard statement for each hazard class and category.

Hazard Communication Standard Major changes ：

- Safety data sheets
- Information and training

Machine Safeguarding

Machine safeguarding :

- Crushed hands and arms, severed fingers, blindness - the list of possible machinery-related injuries as long as it is horrifying.
- There seem to be as many hazards created by moving machine parts as there are types of machines.
- Safeguards are essential for protecting workers from needless and preventable injuries.

Machine safeguarding ：

- Any machine part , function or process which may cause injury must be safeguarded.

Where Mechanical hazards occur ? :

- Dangerous moving parts in three basic areas require safeguarding :
  The point of operation
  Power transmission apparatus
  Other moving parts

Hazardous Mechanical motions & actions :

- A wide variety of mechanical motions and actions may present hazards to the worker.
- These can include the movement of rotating members, reciprocating arms, moving belts, meshing gears , cutting teeth or any part etc.

Types :

Motions

- Rotating
- Reciprocating
- Transversing

Actions

- Cutting
- Punching
- Shearing
- bending

Requirements for Safeguards

Requirements :

- Prevent contact
- Secure
- Protect from falling objects
- Create no new hazards
- Create no interference
- Allow safe lubrication

Protective clothing & Personal protective equipment :

- Engineering controls, that eliminate the hazard at the source and do not rely on the worker's behavior for their effectiveness offer the best and most reliable means of safeguarding.
- Protective clothing and equipment selected must always be :
  Appropriate for the particular hazard
  Maintained in good condition
  Properly sorted
  Kept clean , fully functional and sanitary

Protective clothing & Personal protective equipment ：

- Hard hats
- Caps and hair nets
- Face shields
- Safety glasses , goggles, glasses
- Safety shoes and boots

Ergonomics

Ergonomics :

- It is the science of fitting the job to the worker.
- Designing workstations and tools to reduce work-related musculoskeletal disorders (MSDs) can help workers stay healthy and companies to reduce or eliminate the high costs associated with MSDs.

Causes of MSDs：

- Exerting excessive force
- Excessive repetition of movements that can irritate tendons and increase pressure on nerves.
- Awkward postures can compress nerves and irritate tendons.
- Static postures can restrict blood flow and damage muscles.
- Inadequate recovery time due to overtime, leave inadequate time for tissue healing.

MSD risk factors：

- Force
- Repetition
- Awkward postures
- Static postures
- Quick motions
- Vibration
- Cold temperatures

Work likely to cause MSDs ：

- Manual handling
- Manufacturing and production
- Heavy lifting
- Twisting movements
- Long hours of working in awkward positions

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Record Keeping & Reporting

Recordkeeping requirements :

- Many employers with more than 10 employees are required to keep a record of serious work related injuries and illnesses.
- Minor injuries requiring first aid only do not need to be recorded.

Maintaining & Posting records ：

- The records must be maintained at the worksite for at least five years.
- If requested, copies of the records must be provided to current and former employees or their representatives.

Electronic submission of records ：

- The Injury Tracking Application (ITA), where you can provide information.
- Severe injury reporting by employees

Hazwoper

Hazardous Waste Operations and Emergency Response

Hazwoper ：

- An unexpected release of hazardous substances, or a substantial threat of a hazardous substances release , can pose a significant health and safety risk to workers.
- Unexpected releases can be caused by operation failures and unrelated outside events.
- Employers must adequately prepare emergency response and cleanup workers to clearly understand their roles in managing releases of hazardous substances.

Hazwoper :

- Cleanup operations required by a government body involving hazardous substances.
- Corrective actions involving clean-up operations at sites covered by Resource Conservation and Recovery Act 1976.
- Voluntary cleanup operations at sites recognized by a federal, local or other government body.

Hazwoper :

- Cleanup operations
- Safety & health program
- Site characterization and analysis
- Site control
- Training
- Medical surveillance
- Monitoring
- New technology programs
- Sanitation at temporary workplaces

Thank You....

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Labels & SDS

Labels :

- Labels must provide instructions on how to handle the chemical so that chemical users are informed about how to protect themselves.
- The label provides information to the workers on the specific hazardous chemical.

SDS's :

- Safety Data Sheets which must occupy accompany hazardous chemicals, are the more complete resource for details regarding hazardous chemicals.

Label requirements :

- Labels are an appropriate group of written, printed or graphic informational elements concerning a hazardous chemical that are fixed to, printed or attached to the container.
- Labels must contain : name, address & telephone number, product identifier, signal world, hazard statement(s), precautionary statement(s), pictogram(s).

Workplace labels :

- Employers have the option to create their own workplace labels.
- They can either provide all of the required information that is on the label from the chemical manufacturer or product identifiers.
- The workplace labelling system may include signs, placards, process sheets, batch tickets, operating procedures to identify chemicals.

Safety Data sheets ：

- The SDS includes information such as the properties of each chemical, the physical, health and environmental health hazards , protective measures, and safety precautions for handling , storing and transporting the chemical.
- Total sections in SDS are 16.

Safety Data sheets Sections :

- Identification
- Hazard (s) identification
- Composition / information on ingredients
- First - Aid measures
- Fire - fighting measures
- Accidental release measures

Safety Data sheets Sections :

- Handling and storage
- Exposure controls/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information

Safety Data sheets Sections (not mandatory) :

- Ecological information
- Disposable considerations
- Transport information
- Regulatory information
- Other information

SDS Sections

Section 1 : Identification :

- It identifies the chemical on the SDS as well as the recommended uses.
- Required information consists of product identifier used on the label and any other common names by which substance is known.
  Name, address, phone number and manufacturer and emergency contact number.
  Recommended use of chemical

Section 2 : Hazard(s) Identification :

- The hazard classification of the chemical
- Signal word
- Hazard statement(s)
- Pictograms
- Precautionary statements
- Description of any hazards

Section 3 : composition/information on ingredients :

- This section includes information on substances, mixtures and all chemicals where a trade secret is claimed.

Section 3 : composition/information on ingredients :

Substances

- Chemical name
- Common name and synonyms
- Chemical abstract service (CAS) number and other unique identifiers
- Impurities and stabilizing additives

Section 3 : composition/information on ingredients :

Mixtures

- Same information required for substances
- The chemical name and concentration of all ingredients
- The SDS is used for a group of substantially similar mixtures.

Section 4 : First Aid measures :

It describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical.

- Necessary first-aid instructions by relevant routes of exposure.
- Description of the most important symptoms or effects.
- Recommendations for immediate medical care and special treatment needed, when necessary.

Section 5 : Fire-Fighting measures :

It provides recommendations for fighting a fire caused by the chemical .

- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on specific hazards that develop from the chemical during the fire.
- Recommendations on special protective equipment or precautions for firefighters.

SDS Sections

Section 6 : Accidental release measures :

It provides recommendations on the appropriate response to spills . leaks or releases including containment and cleanup practices to prevent or minimize exposure to people, properties or the environment.

- Use of personal precautions and protective equipment to prevent the contamination of skin, eyes and clothing.
- Emergency procedures
- Cleanup procedures

Section 7 : Handling and storage :

It provides guidance on the safe handling practices and conditions for safe storage of chemicals.

- Precautions for safe handling, including recommendations for handling incompatible chemicals.
- Recommendations on the conditions for safe storage.

Section 8 : Exposure controls/ personal protection :

It indicates the exposure limits, engineering controls and personal protective measures that can be used to minimize worker exposure.

- OSHA permissible Exposure limits (PELs).
- Appropriate engineering controls
- Any special requirements for PPE, protective clothing or respirators.

Section 9 : Physical & Chemical Properties :

It identifies physical and chemical properties associated with the substance or mixture.

- Appearance
- Exposure limits
- Odir
- Vapor pressure and density
- PH
- Relative density
- Evaporation rate
- Viscosity
- Flammability

Section 10 : Stability & Reactivity :

- It describes the reactivity hazards of the chemical and the chemical stability information.
- This section is broken into three parts : reactivity, chemical stability and others.

Section 10 : Stability & Reactivity :

Reactivity

- Description of the specific test data for the chemicals.
- This data can be for a class or family of the chemical.

Section 10 : Stability & Reactivity :

Chemical stability

- Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions.
- Description of any stabilizers that may be needed to maintain chemical stability.

Section 10 : Stability & Reactivity :

Other

- Indication of the possibility of hazardous reactions including a statement whether the chemical will react or polymerize.
- List of all conditions that should be avoided.

Section 11 : Toxicological information :

It identifies toxicological and health effects information or indicates that such data are not available.

- Information on the likely routes of exposure. The SDS should indicate if the information is unknown.
- Description of the delayed, immediate or chronic effects from short term and long term exposure.

SDS Sections (non - mandatory)

Section 12 : Ecological information :

It provides information to evaluate the environmental impact of the chemicals if it were released to the environment.

- Data from toxicity tests performed on aquatic and/or terrestrial organisms, where available.
- Results of tests of bioaccumulation potential.

Section 13 : Disposal considerations :

It provides guidance on proper disposal practices, recycling or reclamation of the chemicals and safe handling practices.

- Description of appropriate disposal containers to use
- Recommendations of appropriate disposal methods to employ.

Section 14 : Transport information :

It provides guidance on classification information for shipping and transporting of hazardous chemicals by road, air, rail and sea.

- UN number
- UN proper shipping name
- Packing group number
- Guidance on transport of bulk

Section 15 : Regulatory information :

It identifies the safety, health and environmentals regulations specific for the product that is not indicated anywhere else on the SDS.

Section 16 : other ：

It indicates when the SDS was prepared or when the last known revision was made.

Managing Safety & Health

Managing Safety & Health :

- The main goal of safety and health programs is to prevent workplace injuries , illnesses and deaths, as well as the suffering and financial hardship these events can cause for workers, their families and employers.
- The recommended practices use a proactive approach to managing workplace safety and health.

Managing Safety & Health :

- Traditional approaches are often reactive - that is - problems are addressed only after a worker is injured or becomes sick, a new standard or regulation is published or an outside inspection finds a problem that must be fixed.

Managing Safety & Health :

Safety and health programs help businesses to :

- Prevent workplace injuries and illnesses
- Improve compliance with laws and regulations
- Reduce costs
- Engage workers
- Enhance their social responsibility goals
- Increase productivity and enhance overall business operations

Walking-Working Surfaces & Fall Protection Standards

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Emergency Action Plan

Emergency Action Plan :

- An Emergency Action Plan is a written document required by particular OSHA standard
- The purpose of an EAP is to facilitate and organize employer and employee actions during workplace injuries.
- Well developed emergency plans and proper employee training will result in fewer and less severe employee injuries and less structural damage to the facility during emergencies.

Emergency Action Plan :

- A poorly prepared plan , likely will lead to an disorganized evacuation or emergency response, resulting in confusion , injury and property damage.

EAP Minimum Requirements :

- Putting together a comprehensive emergency action plan that deals with those issues specific to your worksite is not difficult.
- It involves taking what was learned from your workplace evaluation and describing how employees will respond to different types of emergencies, taking into account worksite layout, structural features and emergency systems.

Develop & Implement an EAP ：

- Drafting an EAP is not enough to ensure the safety of your employees.
- When an evacuation is necessary, you will need responsible , trained individuals who can supervise and coordinate activities to ensure a safe and successful evacuation.

Fight or Flee..? :

- A fire is the most common type of emergency for which small businesses must plan.
- Evacuation plans that designate or require some or all of the employees to fight fires with portable fire extinguishers increase the level of complexity of the plan and the level of training that must be provided to the employees.

Shelter in-place :

- Chemical , biological or radiological contaminants may be released into the environment in such quantity and/or proximity to a place of business than it is safer to remain indoors rather than to evacuate employees.

Fire, Rescue, Medical services :

- Although most of us quickly move away from the hazardous environments created during emergency situations, a group of dedicated and well trained professional emergency responders and medical service personal are tasked with containing and mitigating these incidents.

ELECTRICAL

Electrical Safety :

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PERSONAL PROTECTIVE EQUIPMENT

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OSHA Assessment :

- Safety and Health program management guidelines.
- State programs
- Consultation services
- Strategic partnership program
- Alliance program
- OSHA training and program

Materials Handling

Materials Handling:

- Handling and storing materials involves diverse operations such as hoisting tons of steel with a crane, driving a truck overloaded with concrete blocks, carrying bags or materials manually etc.
- The efficient handling and storing of materials are vital to industry. In addition to raw materials , these operations provide a continuous flow of parts and assemblies through the workplace and ensure that materials are available when necessary.

Materials Handling:

- In addition to training and education, applying general safety principles - such as proper work practices, equipment and controls - can help reduce workplace accidents involving the moving, handling and storing of materials.
- Whether moving materials mechanically or manually, employees should know and understand the potential hazards associated with task at hand and how to control their workplaces to minimize the danger.

Materials Handling:

- Numerous injuries can result from improper handling and storing materials, workers should also be aware of accidents that may result from the unsafe or improper handling of equipment as well as from improper work practices.

Potential hazards for workers:

- Strains and sprains from lifting loads improperly or from carrying loads that are too large and heavy.
- Fractures and bruises caused by being struck by materials or being caught in pinch points.
- Cuts and bruises caused by falling materials.

Basic safety & health practices:

- Ergonomics
- Fire safety
- Training and education

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Hazard Communication Standard Major Changes:

- Safety data sheets
- Information and training

Hazardous Materials

Hazardous Materials :

- A hazardous material is any item or agent which has the potential to cause harm to humans,animals, or the environment either by itself or through interaction with other factors.
- They can be defined as any substance or chemical which is a “ health hazard” or “physical hazard” including chemicals etc.

RadioActive Materials:

- Several agencies have overlapping authorities for regulating shipments of radioactive materials.
- DOT regulates the shipment of hazardous materials, including radioactive elements.

Hazardous Materials Regulations:

- The hazardous materials regulations are in the volume containing parts 100 - 185 and govern the transportation of hazardous materials in all modes of transportation - air, highway, rail and water.

Examples:

- Paints
- Drugs
- Cosmetics
- Cleaning chemicals
- Detergents
- Gas cylinders etc

Permit - Required Confined Space

Permit - Required Confined Space :

- A confined space is large enough for an employee to enter fully and perform assigned work.
- It has a limited or restricted means of entry or exit.
- These spaces may include underground vaults, tanks, storage bins, pits, vessels , silos etc.

OSHA’s Confined Space Standard :

- Employers in general industry must evaluate their workspaces to determine if spaces are permit spaces.
- If a workplace contains permit spaces, the employer must perform exposed employees of their existence, location and hazards they pose.

Written programs :

- Any employer who allows employee entry into a permit space must develop and implement a written program for the space.
- Implement necessary measures to prevent unauthorized entry.
- Identify and evaluate permit space hazards before allowing employee entry.
- Test atmospheric conditions in the permit space before entry operations and monitor the space during entry.

Written programs :

- Establish and implement the means, procedures and practices to eliminate or control hazards necessary for safe permit space entry operations.
- Identify employee job duties.
- Coordinate entry operations when employees of more than one employer are working in the permit space.

Controlling hazards :

- Specifying acceptable entry conditions
- Isolating the permit space
- Providing barriers
- Verifying acceptable entry conditions

Equipment for safe entry ：

- Testing, monitoring, communications, and lighting equipment .
- Barriers and shields
- Ladders etc

Lockout / Tagout

Lockout / Tagout ：

- The lockout/tagout standard establishes the employer's responsibility to protect employees from hazardous energy sources on machines and equipment during service and maintenance.
- This standard gives each employer the flexibility to develop an energy control program suited to the needs of particular workplace and the types of machines and equipment being maintained or serviced.

What must employers do to protect employees ：

- Develop , implement and enforce an energy control program.
- Use lockout devices for equipment that can be locked out.
- Tagout devices may be used in lieu of lockout devices only if the tagout program provides employee protection equivalent to provided through lockout devices.

What must employers do to protect employees ：

- Ensure that new or overhauled equipment is capable of being locked out.
- Develop , implement and enforce an effective tagout program if machines or equipment are not capable of being lockout.
- Develop, document , implement and enforce energy control procedures.
- Use only lockout/tagout devices authorized for the particular equipment or machinery.

What must employers do to protect employees：

- Ensure that lockout/tagout devices identify the individual users.
- Inspect energy control procedures.
- Provide effective training to all employees.

Machine Guarding

Machine Guarding :

- OSHA's responsibility is to ensure the safety of all employees by setting and enforcing standards.
- The areas that you must be familiar with in operating machinery are :
- Point of operation , power transmission unit , additional moving parts.

Machine Guarding :

- Moving machine parts have the potential to cause several workplace injuries such as crushed fingers or hands, burns and blindness.
- Any machine part, function or process that may cause injury must be safeguarded.
- When the operation of a machine or accidental contact injure the operator or others in the vicinity , the hazards must be eliminated or controlled.

Hazard recognition :

- OSHA eTool : focuses on recognizing and controlling common hazards associated with operation and use of certain types of machines.
- Horizontal injection molding machines - interactive safety tour : allows user to take a virtual tour of an injection molding machine.

Machine Guarding :

- Hazard information bulletin : to inform employers/employees that when replacing machine guarding observation windows, they must be replaced with original manufacturer's part or a material having same resistance as the original part.
- To advise that various materials having the same genetic/chemical name may possess different or less effective impact resistance characteristics.

Machine Safeguarding :

- Crushed hands and arms, severed fingers, blindness - the list of possible machinery-related injuries as long as it is horrifying.
- There seem to be as many hazards created by moving machine parts as there are types of machines.
- Safeguards are essential for protecting workers from needless and preventable injuries.

Machine Safeguarding :

- Any machine part , function or process which may cause injury must be safeguarded.

Where Mechanical hazards occur..? :

- Dangerous moving parts in three basic areas require safeguarding :
- The point of operation
- Power transmission apparatus
- Other moving parts

Hazardous Mechanical Motions & Actions :

- A wide variety of mechanical motions and actions may present hazards to the worker.
- These can include the movement of rotating members, reciprocating arms, moving belts, meshing gears , cutting teeth or any part etc.

Types :

Motions

- Rotating
- Reciprocating
- Transversing

Actions

- Cutting
- Punching
- Shearing
- bending

Welding , Cutting and brazing

Welding , Cutting and brazing :

- OSHA's standards for welding, cutting and brazing in general industry and construction were based on the 1967 ANSI standard Z49.1.
- Welding, cutting and brazing are hazardous activities that pose a unique combination of both safety and health risks to a number or workers in a wide variety of industries.

Hazards :

- Health hazards from welding, cutting and brazing operations includes exposures to metal fumes and to UV radiation.
- Safety hazards from these operations include burns, eye damage, electrical shocks, cuts, crushed toes and fingers.
- Many of these can be controlled with proper work practices and PPE.

Most frequently cited provisions:

- If the object to be welded or cut cannot be moved and if all the fire hazards can not be removed, then guards shall be used to confine the heat, sparks and slag and to protect the immovable fire hazards.
- Precautions shall be taken whenever there are cracks or floor openings.
- When arc welding is to be suspended for a period of time , all electrodes should be removed.

Most cited industries :

- Fabricated metal product manufacturing
- Machinery manufacturing
- Transportation equipment manufacturing
- Electrical equipment, component manufacturing
- Primary metal manufacturing
- Motor vehicles and parts dealer
- Miscellaneous manufacturing

Hazardous Substances & Industrial Hygiene

Hazardous Substances :

- A hazardous material is any item or agent which has the potential to cause harm to humans,animals, or the environment either by itself or through interaction with other factors.
- They can be defined as any substance or chemical which is a “ health hazard” or “physical hazard” including chemicals etc.

RadioActive Materials :

- Several agencies have overlapping authorities for regulating shipments of radioactive materials.
- DOT regulates the shipment of hazardous materials, including radioactive elements.

Hazardous Materials Regulations :

- The hazardous materials regulations are in the volume containing parts 100 - 185 and govern the transportation of hazardous materials in all modes of transportation - air, highway, rail and water.

Examples :

- Paints
- Drugs
- Cosmetics
- Cleaning chemicals
- Detergents
- Gas cylinders etc

Industrial Hygiene :

- It is the science of anticipating, recognizing, evaluating and controlling workplace conditions that may cause worker's injury or illness.
- Industrial hygienists use environmental monitoring and analytical methods to detect the extent of worker exposure and employ engineering, work practice controls and other methods to control the potential hazards.

Worksite analysis :

- A worksite analysis is an essential first step that helps an industrial hygienist determine what jobs and workstations are the sources of potential problems.
- The most effective worksite analysis include all jobs, operations, and work activities.

Examples of job hazards :

- Air contaminants
- Chemical hazards
- Biological hazards
- Physical hazards
- Ergonomic hazards

Industrial Hygiene :

- Industrial hygienists are trained to anticipate , recognize, evaluate , and recommend controls for environmentals and physical hazards that can affect the well being and health of workers.
- IH's analyze, identify, and measure workplace hazards that can cause sickness, impaired health etc .
- They can spot conditions and control them through appropriate measures.

Blood Borne Pathogens

Blood Borne Pathogens:

- These are infectious microorganisms in human blood that can cause diseases in humans.
- These pathogens include : hepatitis B, C , HIV but are not limited to these only.

Blood Borne Pathogens:

- OSHA standards for bloodborne pathogens and PPE require employers to protect workers from occupational exposure to infectious agents.
- Bloodborne pathogens are addressed in specific OSHA standards for general safety.

Blood Borne Pathogens:

- Workers in many occupations, including first responders, housekeeping personnels in some industries, nurses all may be at risk for exposure to bloodborne pathogens.
- In order to reduce or eliminate the hazards of occupational exposure to bloodborne pathogens, an employer must implement an exposure control plan for the worksite with details on employee protection measures.

Blood Borne Pathogens:

- The plan must also describe how an employer will use engineering and work practice controls, PPE , employee training , medical surveillance , hepatitis B vaccines and other provisions as per standards.

Ergonomics

Ergonomics :

- It is the science of fitting the job to the worker.
- Designing workstations and tools to reduce work-related musculoskeletal disorders (MSDs) can help workers stay healthy and companies to reduce or eliminate the high costs associated with MSDs.

Causes of MSDs :

- Exerting excessive force
- Excessive repetition of movements that can irritate tendons and increase pressure on nerves.
- Awkward postures can compress nerves and irritate tendons.
- Static postures can restrict blood flow and damage muscles.
- Inadequate recovery time due to overtime, leave inadequate time for tissue healing.

MSD Risk Factors :

- Force
- Repetition
- Awkward postures
- Static postures
- Quick motions
- Vibration
- Cold temperatures

Work likely to cause MSDs :

- Manual handling
- Manufacturing and production
- Heavy lifting
- Twisting movements
- Long hours of working in awkward positions

Work likely to cause MSDs :

- Manual handling
- Manufacturing and production
- Heavy lifting
- Twisting movements
- Long hours of working in awkward positions

Fall Protection

Fall Protection :

- OSHA compliant Fall protection, Fall arrest, Fall resistant systems including our fall protection training and services have been designed to provide ease of handling, installation and use without compromising safety.

Fall Protection :

- OSHA requires fall protection beginning at a height of four feet .
- In construction, fall protection is required above 6 feet.
- Protection must also be provided any time an employee must work above hazardous equipment or machinery , regardless of the distance.

Fall Protection :

- Employers are responsible to determine the locations where fall protection is required, make sure that proper protection systems are provided and finally to implement employee training in their use.
- Compliance with OSHA fall protection regulations requires the right tool for the right job.

Safety and Health Programs

Safety and Health Programs ：

- The main goal of safety and health programs is to prevent workplace injuries, illnesses and deaths as well as the suffering and financial hardships these events can cause for workers , their families and employers.
- The recommended practices use a proactive approach to managing workplace safety and health.

Safety and Health Programs :

- Prevent workplace injuries and illnesses
- Improve compliance with laws and regulations
- Reduce costs
- Engage workers
- Enhance their social responsibility goals
- Increase productivity and overall business operations

Major elements :

- Management commitment and employee involvement
- Worksite analysis
- Hazard prevention and control
- Safety and health training

Management commitment and Employee involvement ：

- The elements of management commitment and employee involvement are complementary and form the core of any safety and health program.
- Management commitment provides the motivating force and the resources for organizing controlling activities within an organization.

Worksite Analysis :

- It involves a variety of worksite examinations to identify existing hazards, conditions and operations in which changes might occur to create new hazards.
- Analyze planned and new facilities , processes , materials and equipment.
- Perform routine job hazards analysis.

Hazard prevention and control :

- Workplace hazards are prevented by effective design of the job site or job.
- Use engineering techniques where feasible and appropriate.

Safety and Health programs :

- Training is an essential component of an effective safety and health program.
- It is often most effective when incorporated into other education or performance requirements.

Record Keeping and Reporting

Recordkeeping Requirements :

- Prevent workplace injuries and illnesses
- Improve compliance with laws and regulations
- Reduce costs
- Engage workers
- Enhance their social responsibility goals
- Increase productivity and overall business operations

Maintaining & Posting Records :

- The records must be maintained at the worksite for at least five years.
- If requested, copies of the records must be provided to current and former employees or their representatives.

Electronic Submission of Records :

- The Injury Tracking Application (ITA), where you can provide information.
- Severe injury reporting by employees

Process Safety Management

Process Safety Management :

- Unexpected releases of toxic, reactive or flammable liquids and gases in processes involving highly hazardous chemicals have been reported for many years, in various industries using chemicals with such properties.
- Regardless of the industry that uses these highly hazardous chemicals there is a potential for an accidental release any time they are not properly controlled , creating the possibility of disaster.

Process Safety Management :

- To help ensure safe and helpful workplaces , OSHA has issued the process safety management of highly hazardous chemical standards which contains requirements for the management of hazards associated with processes using highly hazardous chemicals.

Process Safety Management :

- It is addressed in specific standards for the general and construction industries.
- OSHA's standard emphasizes the management of hazards associated with highly hazardous chemicals and establishes a comprehensive management program that integrates technologies, procedures and management practices.

Asbestos in Workplace

Asbestos in Workplace :

- It is the name given to a group of naturally occurring minerals that are resistant to heat and corrosion.
- It has been used in products such as insulation of pipes , floor tiles, building materials and in vehicles brakes and clutches.
- It includes the mineral fibers chrysotile, amosite, tremolite etc.

Asbestos Hazards :

- It is well recognized as a health hazard and its use is now highly regulated by both OSHA and EPA.
- Asbestos fibers associated with these health risks are too small to be seen with naked eyes.
- It cause cancer of the lungs and other diseases.

What can be done to reduce the hazards of Asbestos :

- Worker exposure to asbestos hazards are addressed in specific OSHA standards for the construction industry, general industry and shipyard employment sectors.
- These standards reduce the risk to workers by requiring that employers provide personal exposure monitoring to assess the risk and hazard awareness training for operations where there is any potential exposure to asbestos.

What can be done to reduce the hazards of Asbestos :

- There is no “safe” level of asbestos exposure for any type of asbestos fiber.
- Where there is exposure, employers are required to further workers by establishing regulated areas, controlling certain work practices and instituting engineering controls to reduce the airborne levels.

Scaffolds

Scaffolding :

- It is a temporary structure used to support a work crew and materials to aid in the construction, maintenance and repair of buildings.
- These are widely used on site to get access to heights and areas that would be otherwise hard to get to .

Scaffolding types：

- Tube and coupler components
- Prefabricated modular system
- H-frame / facade modular system
- Timber scaffolds
- Bamboo scaffolds

Scaffolding components :

- Tubes
- Couplers
- Boards

Highlights of Scaffolding standard ：

- Fall protection or fall arrest systems
- Guardrail height
- Cross bracing
- Footings
- Midrails
- Platforms
- Guying ties and braces
- Trainings
- Inspections

Capacity requirements for all Scaffolds :

- Each scaffold and scaffold component must support without failure its own weight and at least four times the maximum intended load applied or transmitted to it.
- Scaffolds or scaffold components must not be loaded in access.

Hazwoper

Hazardous Waste Operations & Emergency Response

Hazwoper :

- An unexpected release of hazardous substances, or a substantial threat of a hazardous substances release , can pose a significant health and safety risk to workers.
- Unexpected releases can be caused by operation failures and unrelated outside events.
- Employers must adequately prepare emergency response and cleanup workers to clearly understand their roles in managing releases of hazardous substances.

Hazwoper :

- Cleanup operations required by a government body involving hazardous substances.
- Corrective actions involving clean-up operations at sites covered by Resource Conservation and Recovery Act 1976.
- Voluntary cleanup operations at sites recognized by a federal, local or other government body.

Hazwoper :

- Cleanup operations
- Safety & health program
- Site characterization and analysis
- Site control
- Training
- Medical surveillance
- Monitoring
- New technology programs
- Sanitation at temporary workplaces

Thank You