

# Operating Rules

According to safety experts, 50 percent of all crane accidents are attributed to improper setup. The critical points of safe operations, they point out, include:

- Setting the crane up on firm, level ground
- Using hardwood mats or blocking when necessary under outriggers
- Avoiding setup in hazardous areas
- Using ropes or barricades to prevent entry into the lift area
- Inspecting the setup and the crane

## 1.1 Rigging Hazards

The legal requirements for those in authority or in any supervisory capacity on Construction Worksites or in Industrial Facilities include “properly training for competency” the individuals and technicians who are under their care as employees, contractors, engineers, and visitors subject to these hazardous exposures. The liability for not notifying and training all personnel is extremely high.

Injuries, incidents, deaths, and major law suits proceed directly from the lack of implementation of Health and Safety Programs and Competency Training.

The following selected list of typical hazards and hazardous exposures to Health and Safety encountered on Construction Worksites and in Industrial Facilities is NOT definitive, but rather it is a beginning of representing areas that everyone in Construction Work and Facilities Operations needs to be cautioned about.

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The lists in this manual, pertinent to a particular Construction Worksite or Industrial Facility, should be upgraded regularly and added to, as well as tailored specifically to each Worksite or Facility.

### Health hazards

- Fatigue due to extended hours and overtime
- Health from aerosol sprays in close enclosures
- Not applying ergonomic techniques in all tasks
- Lack of proper eye protection, face masks, goggles, safety glasses
- Using pneumatic tools without the proper training by a competent professional
- Wearing improper footwear in shops, on location
- Exposure to impact and high-decibel noise
- Exposure to noise when proper noise attenuation has not been applied to walls, ceilings, and equipment
- Lack of and reasonable care of proper personal protective equipment that is mandated by Federal Regulations
- Lack of proper first-aid practices
- Incorrect lifting and moving equipment
- Lack of proper hand protection, gloves, creams
- Proper bodily protection in every way
- Using pneumatic nailers and other pneumatic devices without full personal protection, hands, face shields, body shields
- Lack of foot protection, work shoes, steel-toed boots
- Lack of a federally mandated Hearing Conservation Program and proper personal equipment, earplugs or muffs
- Not using proper hearing protection and not insulating loud and noisy equipment in the work environment
- Personnel called upon to do too much in short period of times, under stress, pressure, fatigue

### Indoor air quality and ventilation hazards

- Lack of proper ventilation practices and exhaust equipment, (fans, booths, circulation of fresh air)
- Not regularly scheduling high-efficiency particulate air (HEPA) vacuuming work areas and washing down surfaces

- Contamination in ducting, showers, sinks, fan outlets, and air intake units, and from bacteria from microbes
- Carbon monoxide, closed areas, vehicle emissions within garages, studios, enclosed areas of any type
- Not having properly mandated, engineered ventilation in compliance with codes and standards
- Lack of proper storage and use of chemicals in non-ventilated working environments
- Solvents, used without proper personal protective equipment, lack of ventilation, fire hazards, stored incorrectly
- Toxic fumes, vapors, or emissions

#### **Tripping, slipping, and falling hazards**

- Poor floor surfaces, lack of proper maintenance, slippery surfaces, tripping objects
- Not properly abrading steps and tread surfaces
- Not properly cleaning floors and stairs and other surfaces, including walls, grids, and behind lock rails

#### **Chemical exposure hazards**

- Use, storage, lack of facility protection, fire, lack of proper personal protective devices, improper waste storage and disposal
- Lack of training personnel in the use of Material Safety Data Sheets (MSDS)
- Cleaning metal surfaces, skin, eyes, vapors, fire, burns
- Lack of knowledge and misuse of MSDS
- MSDS having misinformation
- MSDS that are not updated with latest findings

#### **Electrical hazards**

- Working near high-power lines, especially with lifts and cranes
- Open electrical circuit boxes, connections, wires
- Improper lighting installations, C-clamp breakage, abraded wires, exposed wires, lack of fusing, open lighting cabinets
- Electrical devices and electricity, cables, equipment
- Electrical systems in noncompliance with required National Electrical Code (NEC) regulations

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- Lack of grounding equipment, Ground Fault Interrupter Circuits (GFICs), etc.
- Non-maintained lighting instruments

### Fire hazards

- Lack of proper fire prevention practices
- Improper application of National Fire Protection Association (NFPA) and Standard of Care Fire Protection Methods and Procedures
- Blocked fire hoses and extinguishers
- Storing too close to sprinkler heads
- Not closing and propping open fire doors
- Smoking around areas where aerosol sprays are used
- Improper storage of flammable or combustible materials (or both)
- Flammable liquids not used correctly, not stored properly, incorrect containers, noncompliance with industry and NFPA standards, spills, improper ventilation, smoking around these liquids, incorrectly marked and non-marked containers, vapors
- Lack of training with fire extinguishers
- Hanging items from sprinkler pipes and heads

### Equipment hazards

- Lack of preventive maintenance of motors
- Use of broken and worn tools
- Lack of safeties on overhead equipment
- Incorrect application of motors
- Lack of proper guards on power equipment
- Lack of redundancy on overhead equipment

### Rigging hazards

- Rope: its use, lack of maintenance and untimely replacement, wrong types, fibers, burns, breaking, wrong knots, cuts, UV damage, corrosion, rotting, drying out
- Defective rigging equipment
- Lack of preventive maintenance of rigging equipment
- Lack of training in safe rigging practices

**Fall hazards**

- FAILURE to mark or barricade the edges, stairs, ramps, and floor openings or working area
- FAILURE to follow Occupational Safety and Health Administration (OSHA) regulations applied to the use of openings or edges of elevated platforms, ramps, trusses, and lifts

**1.2 Regulations****General rigging safety**

29 CFR 1910 Subpart B Adoption and Extension of Established Federal Standards

.12 Construction work

29 CFR 1910. Subpart F Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms

.66 Powered platforms for building maintenance

.67 Vehicle-mounted electing and rotating work platforms

.68 Manlifts

29 CFR 1910 Subpart I Personal Protective Equipment

.133 Eye and face protection

.134 Respiratory protection

.135 Head protection

.136 Occupational foot protection

.137 Electric protective devices

.139 Hand protection

29 CFR 1910 Subpart N Materials Handling and Storage

.178 Powered industrial trucks

.179 Overhead and gantry cranes

.189 Crawler, locomotive and truck cranes

.181 Derricks

.182 Helicopters

.183 Slings

**Construction rigging safety**

29 CFR 1926 Subpart C General Safety and Health Provisions

.26 Personal protective equipment

29 CFR 1926 Subpart E Personal Protective and Lifesaving Equipment

.95 Criteria for personal protective equipment

.96 Occupational foot protection

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- .100 Head protection
  - .101 Hearing protection
  - .102 Eye and face protection
  - .103 Respiratory protection
  - .104 Safety belts, lifelines, and lanyards
  - .105 Safety nets
- 29 CFR 1926 Subpart H Materials Handling Storage, Use, and Disposal
- .250 General requirements for storage
  - .251 Rigging equipment for material handling
- 29 CFR Subpart L Scaffolds
- .451 General requirements
  - .452 Requirements applicable to specific types of scaffolds
  - .453 Aerial lifts
- Appendix B Criteria for determining the feasibility of providing safe access and fall protection for scaffold erectors and dismantlers
- 29 CFR 1926 Subpart M Fall Protection
- .502 Fall protection systems criteria and practices
- 29 CFR 1926 Subpart N Cranes, Derricks, Hoists, Elevators, and Conveyors
- .550 Cranes and derricks
  - .551 Helicopters
  - .552 Material hoists, personnel hoists, and elevators
  - .553 Base-mounted drum hoists
  - .554 Overhead hoists
  - .556 Aerial lifts
- 29 CFR 1926 Subpart O Motor Vehicles and Mechanized Equipment
- .600 Equipment
  - .601 Motor vehicles
  - .602 Material handling equipment
- 29 CFR 1926 Subpart R Steel Erection
- .753 Hoisting and rigging
  - .754 Structural steel assembly
  - .755 Column anchorage
  - .756 Beams and columns
  - .756 Open web steel joists
  - .759 Falling object protection
  - .760 Fall protection
- 29 CFR 1926 Subpart W Rollover Protective Structures (ROPS); Overhead Protection

- .1000 Rollover protective structures for material handling equipment
- .1001 Minimum performance criteria for rollover protective structures for loaders
- .1002 Protective frames (ROPS) for wheel-type agricultural and industrial tractors used in construction

29 CFR Subpart X Ladders

- .1052 Stairways
- .1053 Ladders

**1.3 Standards (Consensus)**

- ANSI American National Standards for Construction and Demolition Operations
- ASME American Society of Mechanical Engineers
- ASSE American Society of Safety Engineers
- CMAA Crane Manufacturers Association of America
- PCSA Power Crane and Shovel Association

**Safety and health program**

- ASSE/SAFE A10.33 Safety and Health Program Requirements for Multiemployer Projects  
American National Standard Construction and Demolition Operations
- ASSE/SAFE A10.38 Basic Elements of an Employer’s Program to Provide a Safe and Healthful Work Environment  
American National Standard Construction and Demolition Operations
- ASSE/SAFE A10.39 Construction Safety and Health Audit Program  
American National Standard for Construction and Demolition Operations
- ASSE/SAFE A10.42 Safety Requirements for Rigging Qualifications and Responsibilities  
American National Standard for Construction and Demolition Operations

ASSE/SAFE Z490.1	Accepted Practices in Safety, Health and Environmental Training
ASSE/SAFE CONSTRUCTION	Construction Safety Management and Engineering—Comprehensive Safety Resource Covering Program Essentials, Best Practices, Legal and Regulatory Requirements and Real World Guidance on Technical Issues

**Personal protective equipment and clothing**

ANSI Z87	Eye and Face Protection
ANSI Z87.1 (2003)	Personal Eye and Face Protection Devices
ANSI Z88	Respiratory protection
ANSI S12	Hearing Protection
ANSI/ISEA Z89.1-2009	Industrial Head Protection
ANSI/ISEA 105-2005	Hand Protection Selection Criteria
ANSI Z41-1999	Protective Footwear
ANSI Z41	User Guide for Protective Footwear
ANSI/ISEA 107-2007	High-Visibility Safety Apparel and Headwear
US TAG—ISO TC 94/SC13	Protective Clothing

**Derricks, cranes and hoists**

ASSE/SAFE CRANE HAZARDS	Crane Hazards and Their Prevention (50 Categories of Crane Hazards, Including Power Line Contact), Types of Upset and Pinch Points and Nip Points
ASSE/SAFE A10.28	Safety Requirements for Work Platforms Suspended from Cranes or Derricks—American National Standard for Construction and Demolition Operations
ASSE/SAFE A10.42	Safety Requirements for Rigging Qualifications and Responsibilities—American National Standard for Construction and Demolition Operations

ASME B30.6	Derricks
ASME B30.5	Overhead and Gantry Cranes (Top-Running Bridge, Single or Multiple Girder, Top-Running Trolley Hoist)
ASME B30.16	Overhead Hoists (Underhung)
ASME B30.17	Overhead and Gantry Cranes (Top-Running Bridge, Single Girder, Underhung Hoist)
ASME B30.11	Monorail Systems and Underhung Cranes
CMAA No.70	Electric Overhead Traveling Cranes—Specifications
CMAA No. 74	Top- and Under-Running Single Girder, Electric Overhead Traveling

**Motor vehicles**

ASSE/SAFE Z15.1	Safe Practices for Motor Vehicle Operations
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**Hoists (wire rope and chain)**

ANSI/ASME/HST-3M	Performance Standard for Manually Lever-Operated Chain Hoists
ANSI/ASTM/HST-4M	Performance Standard for Electric Wire Rope Hoists
ANSI/ASME HST-5M	Performance Standard for Air Chain Hoists
ANSI/ASME HST-6M	Performance Standard for Air Wire Rope Hoists

**Personnel and materials hoists**

ASSE/SAFE A10.4	Personnel Hoists and Employee Elevators on Construction and Demolition Sites—American National Standard for Construction and Demolition Operations
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**Fall protection**

ASSE/SAFE FALL PROTECTION	Introduction to Fall Protection—3rd Edition—Identification of Specific Walking and Working Surface Hazards, Including Slips and Trips, Stairways and Ramps, Ladders, Scaffolds, and Roofs
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- ASSE/SAFE Z359.2 Minimum Requirements for a Comprehensive Managed Fall Protection Program
- ASSE/SAFE Z359.3 Safety Requirements for Positioning and Travel Restraint Systems
- ASSE/SAFE Z359.4 Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
- ASSE/SAFE A10.24 Roofing—Safety Requirements for Low-Sloped Roofs—American National Standard for Construction and Demolition Operations

### Personnel and debris nets

- ASSE/SAFE A10.11 Safety Requirements for Personnel and Debris Nets—American National Standard for Construction and Demolition Operations
- ASSE/SAFE A10.32 Fall Protection Systems—American National Standard for Construction and Demolition Operations

### Walking/working surfaces

- ASSE/SAFE A1264.1 Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace, Floor, Wall, and Roof Openings; Stairs and Guardrails Systems
- ASSE/SAFE A10.18 Safety Requirements for Temporary Roof and Floor Holes, Wall Openings, Stairways, and Other Unprotected Edges in Construction and Demolition Operations—American National Standard for Construction and Demolition Operations
- ASSE/SAFE Z117.1 Safety Requirements for Confined Spaces
- ASSE/SAFE A1264.2 Provision of Slip Resistance on Walking/Working Surfaces

### Energy lockout/tagout

- ASSE/SAFE Z244.1 Control of Hazardous Energy Lockout/Tagout and Alternative Methods

**Steel erection**

ASSE/SAFE A10.13 Safety Requirements for Steel Erection—American National Standard for Construction and Demolition Operations

**Powder-actuated tools**

ASSE/SAFE A10.3 Safety Requirements for Powder-Actuated Fastening Systems—American National Standard for Construction and Demolition Operations

**Site protection**

ASSE/SAFE A10.34 Protection of the Public on or Adjacent to Construction Sites—American National Standard for Construction and Demolition Operations

**Demolition operations**

ASSE/SAFE A10.6 Safety Requirements for Demolition Operations—American National Standard for Construction and Demolition Operations

**Masonry and concrete work**

ASSE/SAFE A10.9 Safety Requirements for Masonry and Concrete Work—American National Standard for Construction and Demolition Operations

**Welding and cutting**

ANSI Z49 Safety in Welding and Cutting

**1.4 Guidelines (Industry)**

- Know the hoist lifting capacity.
- Always know the weight of the object you are lifting.
- Never exceed the working load limit.
- Train operators on proper rigging techniques as well as hoist operation.
- Have rigging handbooks and proper equipment available for use.

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- When rigging, make sure the load hook and upper suspension form a straight line.
- Chain or body of the hoist should never come in contact with the load.
- Never tip-load hooks.
- Always use a sling or lifting device to rig around loads and use engineered lift points for attachment.
- Never work under suspended loads or lift loads over people.
- Never lift people with a hoist.
- When leaving the hoist unattended, land any attached loads.
- When the job is complete, place the hoist and hook in a location that will not interfere with the movement of people or materials.

Source: Industrial Training International, Woodland, WA.

<b>SAFETY POLICIES AND PROCEDURES</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
1. Is there a written, unit-specific policy manual that includes information pertaining to safety policies and procedures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Is there an active unit safety committee or designated unit safety contact?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Are safety meetings held on a regular basis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Are safety bulletin board, web site, and/or other means being used to disseminate safety information throughout the unit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is every employee given a basic safety orientation by their immediate supervisor (or designee) on their first day of the job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Have all employees completed a Slip, Trip, and Fall Prevention course given by a qualified supervisor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Is at least one person at the worksite trained in standard first-aid/CPR?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Have employees, who are designated as first-aid responders or working in other positions where they might reasonably be expected to encounter blood or other bodily fluids, completed a Blood Borne Pathogen Training course presented by a qualified supervisor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 9. Has other safety training, needed to perform each job within the unit, been identified, provided, and documented as required?
- 10. Are there suitable first-aid kits and fire extinguishers available in all project or facility vehicles and each work area?
- 11. Are first-aid kits readily visible, accessible, regularly inspected, and maintained?
- 12. Are emergency telephone numbers posted on all first-aid kits and telephones?
- 13. Has a written Emergency Response Plan been completed for and disseminated throughout the unit?
- 14. Have supervisors of employees who may operate or service equipment or perform tasks (or both) that could result in serious injuries, if safe work practices are not identified and followed, completed a Job Hazard Analysis course presented by a qualified supervisor?
- 15. Have personnel elected or appointed to serve on unit safety committees; unit managers, Supervisors, and other personnel who may be involved in the accident reporting or remediation process attended a Reporting, Reviewing, and Reducing Accidents and Incidents course presented by a qualified supervisor?

**FACILITIES**

**YES NO N/A**

*Exits*

- 1. Are exit signs provided with the word "EXIT" in lettering at least 6 in high and the stroke of the lettering at least 3/4 in wide?
- 2. Are exit doors side-hinged?
- 3. Are all exits kept free of obstructions and unlocked?
- 4. Are at least two means of egress provided from elevated platforms, pits, or rooms where the absence of a second exit would increase the risk of injury from hot, poisonous, corrosive, suffocating, flammable, or explosive substances?

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- 5. Are there sufficient exits to permit prompt escape in case of emergency?
- 6. Are the number of exits from each floor of a building and the number of exits from the building itself appropriate for the building occupancy load?
- 7. When workers must exit through glass doors, storm doors, etc., are the doors fully tempered and meeting safety requirements for human impact?

*Exit Doors*

- 8. Are doors required to serve as exits designed and constructed so that the way of exit travel is obvious and direct?
- 9. Are windows (that could be mistaken for exit doors) made inaccessible by barriers or railing?
- 10. Are exit doors able to open from the direction of exit travel without the use of a key or any special knowledge or effort?
- 11. Are revolving, sliding, or overhead doors PROHIBITED from serving as exit doors?
- 12. When panic hardware is installed on a required exit door, will it allow the door to open by applying a force of 15 lb (2.268 kg) or less in the direction of the exit traffic?
- 13. Do doors on cold-storage rooms have an inside release mechanism that will release the latch and open the door even if it is padlocked or otherwise locked on the outside?
- 14. Where exit doors open directly onto a street, alley, or other area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees from stepping directly into the path of traffic?
- 15. Are doors that swing in both directions between rooms, in which there is frequent traffic, provided with viewing panels in each door?

**ENVIRONMENTAL CONTROLS**

**YES NO N/A**

- 1. Are all work areas properly illuminated?
- 2. Are employees instructed in proper first-aid and other emergency procedures?

- |   |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|
| 3. Are hazardous substances, blood and other potentially infectious materials, which may cause harm by inhalation, ingestion, or skin absorption or contact, identified?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are employees aware of the hazards involved with various chemicals they may be exposed to in the work environment, such as ammonia, chlorine, epoxies, caustics, etc.? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Is employee exposure to chemicals in the workplace kept within acceptable levels?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Can a less harmful method or product be used?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Is the work area ventilation system appropriate for the work performed?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Are spray painting operations performed in spray rooms or booths equipped with an appropriate exhaust system?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Is employee exposure to welding fumes controlled by ventilation, use of respirators, exposure time limits, or other means?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Are welders and nearby workers provided with flash shields during welding operations?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. If forklifts and other vehicles are used in buildings or other enclosed areas, are the carbon monoxide levels kept below maximum acceptable concentration?            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### *Noise Levels*

- |  |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|
| 12. Has it been determined that noise levels in the facilities are within acceptable levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Are steps being taken to use engineering controls to reduce excessive noise levels?      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### *Hazardous Materials*

- |  |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|
| 14. Are caution labels and signs used to warn of hazardous substances (e.g., asbestos) and biohazards (such as blood-borne pathogens)?         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Are wet methods used, when practicable, to prevent the emission of airborne asbestos fibers, silica dust, and similar hazardous materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Are proper precautions being taken when handling asbestos and other fibrous materials?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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17. Is the possible presence of asbestos determined prior to the beginning of any repair, demolition, construction, or reconstruction work?
18. Are asbestos-covered surfaces kept in good repair to prevent release of fibers?
19. Are engineering controls examined and maintained or replaced on a scheduled basis?
20. Is vacuuming with appropriate equipment used whenever possible rather than blowing or sweeping dust?

### *Ventilation*

21. Is the volume and velocity of air in each exhaust system sufficient to gather dusts, fumes, mists, vapors, or gases to be controlled, and convey them to a suitable disposal point?
22. Are exhaust inlets, ducts, and plenums designed, constructed, and supported to prevent collapse or failure of any part of the system?
23. Are clean-out ports or doors provided at intervals not to exceed 12 ft (3.6576 m) in all horizontal runs of exhaust ducts?
24. Where two or more different operations are being controlled through the same exhaust system, could the combination of substances involved create a fire, explosion, or chemical reaction hazard in the duct?
25. Is adequate makeup air provided to areas where exhaust systems are operating?
26. Is the source point for makeup air located so that only clean, fresh air, free of contaminants will enter the work environment?
27. Where two or more ventilation systems serve a work area, is their operation such that one will not offset the functions of the other?
28. Are grinders, saws, and other machines that produce respirable dusts vented to an industrial collector or central exhaust system?
29. Are all local exhaust ventilation systems designed to provide sufficient air flow and volume for the application, and are ducts not plugged?
30. Are belts properly secured to prevent slipping?

- 31. Is personal protective equipment (PPE) provided, used, and maintained wherever required?
- 32. Are there written standard operating procedures for selecting and using respirators where needed?

*Sanitary Facilities*

- 33. Are restrooms and washrooms kept clean and sanitary?
- 34. Is all water provided for drinking, washing, and cooking potable?
- 35. Are all outlets for water that is not suitable for drinking clearly identified?
- 36. When non-potable water is piped through a facility, are outlets or taps posted to alert employees that water is unsafe and not to be used for drinking, washing, or personal use?
- 37. Are employees' physical capacities assessed before they are assigned to jobs requiring heavy work?
- 38. Are employees instructed in the proper manner for lifting heavy objects?
- 39. Where heat is a problem, have all fixed work areas been provided with spot cooling or air conditioning?
- 40. Are employees screened before assignment to areas of high heat to determine if their health might make them more susceptible to having an adverse reaction?
- 41. Are employees, working on streets and roadways who are exposed to the hazards of traffic, required to wear high-visibility clothing such as bright-colored (traffic orange) warning vests?
- 42. Are exhaust stacks and air intakes located so that nearby contaminated air will not be recirculated within a building or other enclosed area?
- 43. Is equipment producing ultraviolet radiation properly shielded?
- 44. Are universal precautions observed where occupational exposure to blood or other potentially infectious materials can occur and in all instances where differentiation of types of body fluids or potentially infectious materials is difficult or impossible?

*Piping Systems*

- 45. When non-potable water is piped through a facility, are outlets or taps posted to alert employees that the water is unsafe and not to be used for drinking, washing, or other personal use?
- 46. When hazardous substances are transported through above-ground piping, is each pipeline identified at points where confusion could introduce hazards to employees?
- 47. When pipelines are identified by color-painted bands or tapes, are the bands or tapes located at reasonable intervals and at each outlet, valve, or connection, and are all visible parts of the line so identified?
- 48. When pipelines are identified by color, is the color code posted at all locations where confusion could introduce hazards to employees?
- 49. When the contents of pipelines are identified by name or name abbreviation, is the information readily visible on the pipe near each valve or outlet?
- 50. When pipelines carrying hazardous substances are identified by tags, are the tags constructed of durable materials, the message printed clearly and permanently, and are tags installed at each valve or outlet?
- 51. When pipelines are heated by electricity, steam, or other external source, are suitable warning signs or tags placed at unions, valves, or other serviceable parts of the system?