

# **ACCIDENT PREVENTION PLAN**

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Yakima Valley Community College

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## YAKIMA VALLEY COMMUNITY COLLEGE ACCIDENT PREVENTION PLAN

### **The Campus Safety Policy**

Yakima Valley Community College personnel believe in the dignity and importance of each individual employee and their right to a safe and healthful working environment. Employee initiative and diligence in promoting this program will reflect directly upon the conservation of the college's resources. The most effective influence on employees will be the example and guidance of co-workers. In order to promote this belief, the following statements constitute the safety and health policy for Yakima Valley Community College.

1. The prevention of accidents and the elimination of safety hazards is the inherent responsibility of every individual employed at this institution.
2. Administrators and supervisors have an added responsibility to insure that safety training and education of personnel is accomplished.
3. Campus organizational units must implement applicable sections of the campus' accident prevention program and the Washington Administrative Code emphasizing the integration of safety measures so that safety and job performance become one.
4. Accident prevention activities will be reinforced by a systematic evaluation of ways to minimize physical hazards within the workplace.

### **Administrative Responsibility**

Yakima Valley Community College is responsible for establishing, supervising and enforcing in a manner that is effective in practice:

- A safe and healthful working environment.
- Maintain / provide an accident prevention program
- Provide training programs to improve the skill and competency of all employees in the field of occupational safety and health. Such training will include on-the-job instructions on the safe use of powered materials handling equipment, machine tool operations, use of toxic materials and operation of utility systems prior to assignments to jobs involving such exposures and such training will be documented.
- Provide for first-aid training and certification. Those employees trained in first-aid will also be required to receive blood borne pathogen training.
- Appoint a Yakima Valley Community College safety officer, (campus safety & security supervisor) the safety officer has the overall responsibility for establishing, implementing and overseeing the campus safety program. However, **day to day** implementation, oversight and monitoring is the **responsibility** of each **department head or supervisor and individual employees**.
- Administrators in each department will ensure that a first aid kit is provided and placed in a location for all employees to access.

## Employee's Responsibility

The term *employee* shall include all full-time, temporary, or part-time classified, staff, faculty or students employed by the college. It is the responsibility of every employee to:

1. Coordinate and cooperate with other employees in an attempt to eliminate accidents. Failure to observe workplace safety and/or a demonstrated pattern of accidents may result in corrective action and/or progressive discipline where appropriate.
2. Study and observe all safe work practices governing their work.
3. Employees should offer safety suggestions, wherein such suggestions may contribute to a safer work environment.
4. Apply the principles of accident prevention in their daily work and use proper safety devices and protective equipment as required by Yakima Valley Community College.
5. Properly care for all personal protective equipment.
6. Make a prompt report to their immediate supervisor of each industrial injury or occupational illness, regardless of the degree of severity.
7. Report hazardous conditions (unsafe equipment, floors, etc.) and unsafe acts to supervisor and the campus safety officer.
8. Observe all hazard warning and no smoking signs.
9. Keep aisles, walkways, and working areas clear of slipping/tripping hazards.
10. Know the location of fire/safety exits and evacuation procedures.
11. Keep all emergency equipment such as a fire extinguishers, fire alarms, fire hoses, exit doors, and stairways clear of obstacles.
12. Not be under the influence of alcoholic beverages or drugs during working hours, when on college business, or on college property.
13. Refrain from fighting, horseplay, or distracting fellow workers.
14. Operate only the equipment for which authorized and properly trained, and observe safe operating procedures for this equipment.
15. Know the location of first-aid kits and spill kits in work areas.
16. Follow proper lifting procedures at all times.

17. Ride as a passenger in a vehicle only if it is equipped with a rider's seat.
18. Be alert to see that all guards and other protective devices are in their proper places prior to operating equipment.
19. Refrain from wearing frayed, torn, or loose-fitting clothing, jewelry, thongs, tennis shoes, or long unrestrained hair near moving machinery or other sources of entanglement, or around electrical equipment.
20. Actively support and participate in the college's efforts to provide a safety program.
21. In order to insure the safety and health of themselves and other employees, an employee must promptly report non work-related injuries, physical conditions, or other limitations that might adversely affect the employee's ability to safely perform work tasks. This also includes reporting to the supervisor, all medications or physical restrictions prescribed to them by their physician that could affect the ability to safely perform work tasks.

Employees will not operate **any** equipment that does not meet applicable codes and standards.

### **Campus Safety Committee**

A safety committee has been established (with representatives from staff and management) in order to assist in the detection and elimination of unsafe conditions and work procedures.

1. The committee will operate under the following guidelines:
  - A. The committee shall include one elected classified, one elected faculty, one appointed exempt employee from each division of the college (Arts & Sciences, Workforce Education, Student Services, Library, Technology Services (classified & exempt only), Business Services (classified & exempt only), Maintenance / Operations / Security (classified & exempt only) and Human Resource Services. In addition the safety officer shall be a nonvoting member.
  - B. The terms of the employee-elected members shall be one year. Should a vacancy occur on the committee, a new member will be elected prior to the next scheduled meeting. Terms will be from January to December.
  - C. The frequency of meetings must be determined by the committee, but the committee shall meet at least four times a year.
  - D. The chairman shall be the safety officer.
  - E. The date, hour, and location of meetings shall be determined by the committee.
  - F. The length of each meeting shall not exceed one hour except by majority vote.

- G. Member attendance, subjects discussed, and documentation shall be maintained on file for a period of one year. Copies of the minutes of committee meetings shall be provided to the safety officer and to college employees by posting on the bulletin board and placing in break areas.
- 2. The committee or its designee will perform the following functions:
    - A. Assist in-house safety inspections.
    - B. Assist in accident investigation to uncover trends.
    - C. Review accident reports to determine means of eliminating repeated accidents.
    - D. Receive and evaluate employee suggestions.
    - E. Review job procedures and recommend improvements.
    - F. Monitor the safety program effectiveness.
  - 3. The committee will assist supervisors, as needed, in conducting inspections of their respective work areas to determine what hazardous conditions and/or practices exist.
    - A. Inspections shall be conducted according to the following sources:
      - (1) General Safety and Health Standards.
      - (2) Employee suggestions.
      - (3) Previous accident experience of the college.
    - B. The supervisor shall follow-up committee recommendations in one of the following ways:
      - (1) Carrying out the recommendations.
      - (2) Explaining why no action can be taken.
      - (3) Proposing an alternative.
    - C. Findings of the inspection will be reviewed and discussed at the next scheduled safety committee meeting. Unresolved problems resulting from this inspection will be forwarded through the safety committee to the college president.

## **Accident Reporting, Investigating, and Record Keeping**

### **Accident Reporting Procedures**

All work-related injuries, illness, and/or property damage (regardless of the severity) must be reported by the employee to the supervisor.

#### **Physical Injuries - Employees**

- 1. Get medical attention, if necessary, and have the assisting physician complete the appropriate forms required for the Department of Labor and Industries.
- 2. Report accident to campus security.

3. Obtain an Accident Report form from a security officer. Complete and submit to immediate supervisor within two working days, if possible.
4. If appropriate, complete leave slip and forward to human resources.

#### **Physical Injuries - Students, Volunteers, Visitors**

1. Get medical attention, if necessary.
2. Report accident to campus safety officer.
3. Obtain Accident Report form from a security officer. Make sure a copy of the accident report is filed with Human Resources.
4. Tort claims are filed with administrative assistant to the President.

#### **Vehicle Accidents**

Accidents involving travel or vehicles should be reported to the proper law enforcement agency and the standard Washington Motor Vehicle Collision Report filed with the appropriate agencies. A State of Washington Vehicle Accident Report must be filed in the administrative services office within two working days.

#### **Property Accidents**

Losses or claims involving district property or property of the general public shall be reported to the administrative services office.

#### **Reporting Other Limitations**

In order to insure the safety and health of themselves and other employees, an employee must promptly report non work-related injuries, physical conditions, or other limitations that might adversely affect the employee's ability to safely perform work tasks. This also includes reporting to the supervisor, all medications or physical restrictions prescribed to them by their physician that could affect the ability to safely perform work tasks.

#### **Industrial Insurance Forms**

Employees are covered by state industrial insurance and must complete a state industrial insurance "Report of Accident" form in addition to YVCC's Accident Report Form (YVCC B-19). This state form must be filed with the State Department of Labor and Industries following all accidents requiring treatment by a physician. This form is usually completed by the employee in the doctor's office and forwarded by the attending physician to the appropriate college offices and the State Department of Labor and Industries.

#### **Reporting of Fatality or Multiple Hospitalization Incidents**

Within eight (8) hours after the fatality or probable fatality of any employee from a work-related incident or the multiple inpatient hospitalization of two (2) or more employees from a work-related incident, the administrative services office will orally report the incident in person to the nearest office of the Department of Labor and Industries, or by telephone using the OSHA toll-free central telephone number, 1-800 321-6742. If the campus does not learn of the incident at the time it occurs, the campus will report the incident within eight (8) hours of the report to a representative of the campus. This

applies to each fatality or multiple inpatient hospitalization that occurs within 30 days of the incident. Each report must include the following information:

1. Name of campus.
2. Location of the incident.
3. Time of the incident.
4. Number of fatalities or hospitalized employees.
5. Contact person & telephone number.
6. A brief description of the incident.

### **Preserving the Incident Scene**

The first priority in every incident resulting in injury is the safety and health of the injured and all other workers. While assisting the injured, care should be taken to preserve the incident scene intact as much as possible to enable those investigating the incident to accurately determine the causes.

Equipment involved in an incident resulting in the immediate or probable fatality or inpatient hospitalization of two (2) or more employees must not be moved until the L&I representative investigate the incident and release the equipment, except where removal is essential to prevent further incident. Where it's necessary to remove the victim, the equipment may be moved only to the extent of making possible the removal.

### **Reporting Near Misses**

Near misses or close calls often precede incidents of a similar nature. Therefore, near misses or close calls should be reported to the supervisor so corrective steps can be taken to prevent further occurrences.

### **Incident Investigations**

An investigation of the cause of any incident that causes serious injuries, with immediate symptoms, will be conducted as soon as possible after the emergency actions are completed. The investigation will be conducted by the security department. The immediate supervisor of the injured employee, witnesses, employee representative, and any other person with the special expertise required to evaluate the facts relating to the cause of the incident. The findings of the investigation will be reviewed by the safety committee and kept for further reference. If the employee representative is the business agent of the employee bargaining unit and is unavailable to participate without delaying the investigation, one of the following alternatives should be used:

1. The shop steward or other union representative as appropriate acts as the employee representative.
2. An employee representative member of the safety committee acts as the employee representative.
3. The employees select a person to represent them.

### **Record Keeping and Posting**

Yakima Valley Community College maintains a record of occupational injuries and illnesses. Those injuries that are recordable are entered onto OSHA 101 and 200 forms.

Copies of the OSHA 200 form (with the names of injured persons removed or concealed) will be posted annually, in the payroll office. *Note: Recordable cases include:*

1. Every occupational death.
2. Every industrial illness.
3. Every occupational injury that involves one of the following:
  - A. Unconsciousness.
  - B. Inability to perform all phases of regular job.
  - C. Inability to work full time on regular job.
  - D. Temporary assignment to another job.
  - E. Medical treatment beyond first-aid.

The safety officer is responsible for posting and keeping posted the WISHA Poster, *Job Safety and Health Protection*; form F416-081-000 furnished by the Division of Industrial Safety and Health, Department of Labor and Industries. The posters will be placed in a conspicuous place where other notices to employees are customarily posted. Appropriate steps will be taken by the safety officer to assure that such notices are not altered, defaced, or covered by other materials.

#### **Vehicle Accidents**

In the event a state or college owned vehicle or a private vehicle of a person on state business is involved in a traffic accident, the driver will take care of the accident scene and then promptly notify their immediate supervisor or lead for further instructions. The supervisor/lead will then notify the dean of administrative services. No vehicle shall be moved from the scene until the police arrive, unless a greater hazard would be created by failure to remove said vehicle from the scene. The driver must remain at the scene, may offer aid to the injured, and exchange information.

#### **Emergency Procedures**

To report a death, life threatening emergency or catastrophe, employees are to dial **911** and describe the location and emergency to the dispatcher, and then notify their supervisor. Immediately afterwards call campus security at 4610 and report incident.

Other emergency procedures for the Grandview campus and Yakima campus are posted in every classroom, staff handbooks and each "safety" bulletin board.

### **Accident Prevention**

#### **Administrative Inspections**

The safety officer and area supervisors will perform safety inspections on a regular basis for the purpose of reducing accidents by locating hazardous conditions and implementing corrective measures. In order to maintain maximum program effectiveness, a periodic review and update of this safety program will be performed to reflect changes in laws, workplace conditions or equipment.

#### **Reporting Possible Hazards**

Employees should report to the supervisor possible workplace hazards such as unsafe conditions or unsafe equipment. This assists the safety program in responding to changes in workplace conditions.

### **State Safety Inspections**

In the event of an inspection by Department of Labor and Industries compliance representatives, the safety officer will accompany them. An effort will be made to immediately correct where possible, any hazards that are identified and assist in answering any questions they might have.

### **Safety Training**

Periodic training of employees will be conducted to review existing safety procedures, to examine new requirements, and to improve the safety practices of all employees.

### **Safety Meetings**

Yakima Valley Community College employees in moderate or greater risk environments (as specified by the safety committee) will attend monthly safety meetings conducted by supervisor or weekly supervisor/employee "tool box" meetings. The following are the main safety topics which will be covered, as needed, in the meetings:

1. Safety topics of immediate employee interest.
2. A review of any safety inspections conducted since the last safety meeting
3. A review of any citations to assist in the correction of hazards
4. An evaluation of any safety concerns submitted since the last meeting to determine if the cause of the unsafe acts or conditions has been identified and corrected.
5. Acts or conditions that have been identified and corrected.
6. Other general safety or safety training topics as needed.

Additional unscheduled safety briefings may be called at any time, should a situation warrant an immediate sharing of safety information. Safety meetings will be documented, available for workers to see, and maintained on the premises for one year.

### **Safety Bulletin Boards**

A safety bulletin board must be installed and maintained in every fixed establishment employing eight or more persons, sufficient in size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material. It is recommended that safety bulletin boards be painted green and white.

1. Safety bulletin boards will be installed and maintained in the following locations:
  - A. Security.
  - B. Human Resources
  - C. Maintenance.

- D. Grandview Campus (hallway into main office).
2. A specific safety bulletin board or portion of an existing bulletin board should be designated and that spot reserved EXCLUSIVELY for safety material.
3. The safety officer is responsible for the appropriate and timely maintenance of safety bulletin boards.
4. Posting should be attractively arranged.
5. Posters, safety committee minutes and other information that becomes dated or worn should be changed periodically.
6. The following items shall be posted:
  - A. WISHA Poster, II-416081.
  - B. Industrial Insurance Poster LI-210-191.
  - C. Citation and Notice (as appropriate).

#### **Disposing of Hazardous Materials**

A hazardous material is any substance in any quantity or form that could jeopardize health, safety, or property. Such materials include toxic chemicals, flammable liquids or solids, poisons, corrosives, compressed gases and others. Check with the safety officer for instructions when disposing of any potentially hazardous material. Proper procedures must be followed. (See employee hazard communication plan for details.)

#### **Reasonable Accommodation**

The campus will provide reasonable accommodation as specified in the Americans with Disabilities Act (ADA) for those qualifying employees making a request. Employees may request reasonable accommodation through their supervisor or the human resources office.

#### **The Following is Forbidden**

1. Remove, displace, damage, destroy or carry off any safety device, safeguard, notice, or warning, furnished for use in any employment or place of employment.
2. Interfere with the use of any method or process adopted for the protection of any employee, including self, in such employment, or place of employment.
3. Failure or neglect to do everything reasonably necessary to protect the life and safety of employees.

#### **Smoking in the Workplace**

Smoking is not permitted on campus except at designated locations, campus vehicles or in the vicinity of flammable materials, such as solvents, low flash point materials, propane, gasoline, etc.

#### **Drugs**

No staff member will partake or be under the influence of intoxicating beverages or narcotics (drugs) during working hours. The rule does not apply to persons taking prescription drugs/narcotics as directed by a physician, unless such use shall endanger the employee or others. Employees taking prescribed medications which could impair their judgment or ability to operate equipment should advise their supervisor prior to starting work under the influence of any such medication.

### **Violence Prevention Program**

Employees will be made aware of the campus violence prevention program. Training will be periodically offered to employees regarding hazard assessment, mitigation and emergency procedures. Any employee who believes they have a special risk should immediately report their concerns to security.

## **Training and Safety Orientations**

### **Introduction**

Training is an ongoing process, beginning with an initial orientation and continuing with regular safety meetings, instruction and review. All are designed to enhance an employee's knowledge, understanding or skill in identifying hazards in their workplace and applying safe work procedures. The goal is a safer workplace for everyone.

### **New Employee Safety Orientation**

Every new employee (including full-time and those transferred from another college) will attend a safety orientation session, including a tour of the facilities, be informed of the locations of the college's policies and procedures manuals, and the safety manuals.

Among other topics the orientation will cover:

1. The Yakima Valley Community College safety program.
2. The Yakima Valley Community College Violence Prevention program.
3. How to report work-related injuries and illness.
4. How to report unsafe practices and conditions.
5. Location of first-aid facilities.
6. Use and care of personal protective equipment.
7. Actions in the event of emergency.
8. Identification of hazardous materials or situations.
9. On-the-job safety procedures.
10. Fire related emergency training.

### **Additional Review and Training**

Periodic training of employees will be conducted to review existing safety procedures, to examine new requirements, and to improve the safety practices of all employees.

### **Non-Routine Work Tasks**

If an employee is given a special job that is new or unfamiliar, or differs from routine work assignments, the supervisor is responsible for providing training so the employee is able to:

1. Identify new workplace hazards (including chemicals).

2. Know how to protect themselves.

### **Safety Meetings**

Yakima Valley Community College employees in moderate or greater risk environments (as specified by the safety committee) will attend monthly safety meetings conducted by departmental supervisor or weekly supervisor/employee “tool box” meetings. The following are the main safety topics which will be covered, as needed, in the meetings:

1. Safety topics of immediate employee interest.
2. A review of any safety inspections conducted since the last safety meeting.
3. A review of any citations to assist in the correction of hazards.
4. An evaluation of any safety concerns submitted since the last meeting to determine if the cause of the unsafe acts or conditions has been identified and corrected.
5. Acts or conditions that have been identified and corrected.
6. Other general safety or safety training topics as needed.

Additional unscheduled safety briefings may be called at any time, should a situation warrant an immediate sharing of safety information. Departmental safety meetings will be documented, available for workers to see, and maintained on the premises for one year.

### **Safety Bulletin Boards**

A safety bulletin board must be installed and maintained in every fixed establishment employing eight or more persons, sufficient in size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material. It is recommended that safety bulletin boards be painted green and white.

### **Training Materials and Objectives**

An explanation of the campus' safety program, safety hand out materials and a personal safety orientation session are part of the orientation process. The following topics are covered, in detail, in the initial safety training and orientation:

1. Yakima Valley Community College Safety and Occupational Accident Prevention Program.
2. How and when to report work-related injuries and illness.
3. How to report unsafe practices and conditions.
4. Location of first-aid facilities.
5. Use and care of required personal protective equipment.
6. Actions in the event of emergency.
7. Identification of hazardous materials or situations.
8. Fire related emergency training.
9. On-the-job safety procedures, such as:
  - A. General Safety.
  - B. Hazardous Chemicals. (Hazardous Communication Plan)

- C. Special Equipment Operating Procedures.
- D. Lifting Procedures.
- E. Forklift Operations.
- F. Vehicle Safety.

**Hazardous Chemical Training** (please see employee hazard communication plan)

#### **Documentation**

Records of safety and health training sessions and other training will be kept in the human resources office.

### **Tools, Equipment, and Personal Protection**

#### **General Protection**

Employees may only utilize machinery, tools, materials or equipment, whether owned by the employee or the college that meet the safety or health requirements of this program or any applicable Washington Administrative Code (WAC).

Selecting the proper tool or piece of equipment for a particular job is an important step in maintaining a safe workplace. Tools or equipment may only be used in accordance with the manufacturers designed or intended purpose.

Appropriate personal protective equipment (PPE) must be used to protect against injuries or damage from various types of hazards. Before each day's use employees must carefully inspect personal protective equipment, clothing, devices, tools and equipment to make sure they are in good condition. Those items found to be defective must be taken out of service. Some specific requirements are listed below.

#### **Training**

Employees must be trained by **supervisor** so that each employee knows what PPE is required for the various work area or tasks which he or she may be assigned. Employees should know:

1. When PPE is necessary.
2. What PPE is necessary.
3. How to put on the equipment correctly.
4. How to adjust and remove equipment.
5. The limitations of the PPE.
6. Proper care, maintenance, life and disposal of the PPE.

Training records must be kept by **supervisor** and should include the name of the employee, the date(s) of the training, and identify the document as a certification of training.

The safety officer is responsible for assuring compliance with this policy. Retraining may be necessary if an employee does not use the equipment as required. Disciplinary action, up to and including termination, may be necessary for employees who repeatedly do not follow safety procedures when using equipment.

#### **Personal Protective Equipment Specifications**

Equipment purchased after July 5, 1994 should meet the most current ANSI standard. Eye protection purchased after this date should meet ANSI Z87.1 - 1989. Head protection should meet ANSI Z89.1 - 1986. Foot protection should meet ANSI Z41 - 1991. The safety equipment vendor should supply written evidence that PPE purchased by Yakima Valley Community College meets these ANSI standards.

### **Occupational Head Protection**

Persons working around machinery or in locations which present a hair catching or fire hazard must wear caps or other type of head covering which completely covers the hair. Caps with metal buttons or metal visors may not be worn around electrical hazards.

Note 1: The following is the Washington State definition of hair lengths considered hazardous:

1. When the length would exceed the circumference of exposed revolving shafts or tools in fixed machines by 200 percent.
2. When the length would exceed the radius of pressure rolls with exposed in-running nip points.
3. When the employee is exposed to an ignition source and the employee may, with hair aflame, run into an area containing class-1 flammable liquids or combustible atmospheres.
4. When exposures require personal protective devices, such as mask-type respirators or ear-cup-type hearing protection devices, and hair, either facial or head, would interfere with a proper seal.

Note 2: When hair length is judged hazardous from a hair catching standpoint [instances (a) or (b) under interpretations in Note 1] minimal confinement must be within netting which controls all loose ends.

Note 3: If hazardous from fire hazard aspects [instance (c) of Note 1] the hair must be confined within a solid-type material.

### **Eye and Face Protection**

The WISHA standard requires employees to use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids, or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. Further, each affected employee must use eye protection that provides side protection when there is a hazard from flying objects. Yakima Valley Community College will supply appropriate eye and face protection (safety glasses, goggles, face shields, welding face shields, etc.) to affected employees for their personal use. Employees who wear prescription glasses will be provided with safety eye wear that fits over the glasses.

Eye protection must be worn whenever there is a reasonable possibility that an eye injury could occur. Eye wash stations are located in each science lab, the automotive shop, and the nursing lab in Sundquist Hall.

Suitable eye protection may include safety glasses, goggles, face shields or approved dark glasses. The degree of hazard indicates the type of eye protection.

Eye protection is required in operations involving welding, drilling, chipping, hammering, or other hazardous equipment and operations.

### **Illumination of Work**

Whenever natural light is insufficient to illuminate work operations, artificial illumination should be provided to enable the work to be performed safely.

### **Hand Protection**

The OSHA standard requires employees to use appropriate hand protection when their hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful radiation or temperature extremes. Hands must be kept out of the immediate cutting area or point of operation of any cutting type of equipment. In addition gloves should be worn to protect the hands from cuts, abrasions or other material handling hazards.

### **Foot Protection**

The State of Washington requires employees to wear “substantial” footwear made of leather or other equally firm material whenever there is a danger of injury to the feet through falling or moving objects, or from burning, cutting, penetration, electrical or like hazard.

### **Substantial Footwear Definition and Requirements**

Substantial footwear is made of leather or other equally firm material and must satisfy the following requirements:

1. The soles and heels of such footwear must be of a material that will not create a slipping hazard.
2. Footwear that has deteriorated to a point where it does not provide the required protection may not be used.
3. Traditional tennis shoes with canvas tops, or thin or soft soled athletic shoes, open toed sandals, slippers, dress shoes or other similar type shoes may not be worn in performing hazardous operations. Soft or athletic-type soles with uppers of leather or other substantial material may be approved by the shop supervisor for use where firm footing is desired and where a minimal danger exists of injury to feet from falling or moving objects (shoes or boots must be approved by the shop supervisor).

### **Hearing Protection**

Hearing protection should be worn whenever an employee is exposed to high or long duration noise levels such as grinders or other abrasive equipment. Sound levels may not exceed 85 dB TWA, without a formal hearing protection program. Soft ear protectors are supplied by each department for lower level noise exposures and employees are required to use them.

### **Clothing**

Clothing sufficient to protect against the hazards of the operations being performed must be used. Loose shirt sleeves or overall sleeves are not allowed. Sleeves should be buttoned or rolled up.

Rings, earrings, wrist watches and other jewelry must not be worn where they create a potential safety hazard.

## **Lockout/Tagout Procedures**

### **Purpose**

This program explains the policies and procedures to be used by employees who perform maintenance or service on machinery and equipment in order to prevent the accidental release of hazardous energy. This program also lists training requirements for employees and a method that the college will use to ensure that the program and its procedures are being used and are up to date. This program was written because Yakima Valley Community College realizes that employees who service or work around machines or equipment that is being serviced can be exposed to hazards which may cause serious injury if energy from power sources and energy stored in the machine or equipment is not placed under control during service.

### **Policy and Compliance**

It is the policy of Yakima Valley Community College that machines or equipment shall be completely isolated from all energy sources and made inoperative during maintenance or service when unexpected energizing, start-up, or release of stored energy could occur and cause injury. This will be accomplished by attaching the appropriate lockout devices and information tags to energy isolating devices and otherwise disabling the machine or equipment by following specific written energy control procedures contained in this program. No employee shall attempt to start or use any machine or equipment which is locked out or tagged out. Any employee who fails to follow this policy will be subject to the disciplinary procedures of the college.

### **Electric Cord and Plug Connected Equipment**

No lockout or tagout is required for electrical equipment connected by cord and plug when the hazards of unexpected energization or start up is controlled by unplugging the equipment and the authorized employee maintains exclusive control of the lug while performing the service or maintenance.

### **Lockout Tools and Materials**

The following devices will be made available for use by authorized employees:

1. **Lock:** An individually identified Master lock keyed padlock is provided to each authorized employee. This lock is different in color from other locks used at this workplace and is only to be used for lockout purposes. Each lock is issued with only one key so that the authorized person to whom it is issued except under special conditions explained elsewhere in this program can open it.
2. **Information tag:** A sample of a properly filled out tag is shown in an appendix at the end of this document. Tags must always be used to provide the required information at each lockout or tagout point on the machine or equipment. The tag is designed to withstand any

conditions in this workplace that might cause it damage. The tag must be used with a non-reusable self-locking cable tie or equivalent method that will withstand 50 pounds before failing.

### **Lockout Procedures**

A general lockout procedure is included at the end of this program. It shall be used by authorized employees as a checklist for locking out any machine or equipment that:

1. Has a single energy source that can be easily identified and isolated with a single lockout device that is controlled only by the authorized employee(s). For example, an electrical lockable disconnect switch adjacent to the machine or equipment represents such a case.
2. Has no stored, leftover, or re-accumulated energy potential (such as flywheels, capacitors, springs, static electricity, or udder dies of press brakes).
3. Does not create hazards for other employees when serviced.
4. Has not had an accident in connection with service or maintenance.

### **Tagout Procedures**

Specific tagout procedures are included at the end of this program for each machine or piece of equipment which has an energy isolating device that cannot be locked out with a lock and information tag because there is no place to attach the lock. The procedure written for all of this type of equipment shall be used by authorized employees as a tagout checklist for the specific device. Each tagout procedure requires an extra step in de-energizing the machine or equipment to compensate for the lack of a lock on the energy source. Extra steps might include removing a component such a wiring connections, blocking a switch, opening an extra switch or removal of a valve handle to reduce the likelihood of accidental activation. These machines or equipment will be provided with lockable energy isolating devices as the future need arises for major repair, replacement, modification, or relocation of the machine or equipment.

### **Employees are cautioned that:**

1. Tags are warning devices and do not provide the physical restraint that is provided by a lock.
2. When a tag is attached to an energy-isolating device, it is not to be removed without permission of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
3. Tags must be legible and understandable by all employees who may come across them in order to be effective.
4. Tags and their means of attachment must be made of materials that will withstand the environmental conditions in which they are used.
5. Tags must be securely attached to energy isolating devices so that they cannot accidentally fall or be pulled off.

6. Tags may evoke a feeling of false security. The authorized employee should periodically check that employees understand that a tag has been placed and that the tag is still properly attached and visible.

### **Group Lockout**

When maintenance or service of a machine or equipment is done by more than one authorized employee, one of the authorized employees will be designated as the project manager. The project manager is responsible to ensure that the energy control procedure is followed and that no employee is exposed to a hazard during and at the conclusion of the project. The following procedure will be initiated to ensure that all employees engaged in the project are protected by a lock under their control. A hasp will be used at each lockout point that will permit each authorized employee to attach his/her lockout device to the energy-isolating device. The project manager is always the last authorized employee to remove his/her lock.

### **Shift Changes**

When the servicing or maintenance of a machine or equipment takes longer than a single shift, the appropriate control measure shall be used:

1. If control does not need to be transferred to a new work crew, then the locks or tags of the authorized employee(s) shall remain on the energy isolating devices to protect against accidental activation of the machine or equipment by other employees while the authorized employees are away.
2. If control must be passed on to a crew on the following shift, then the incoming crew shall review the appropriate lockout/tagout procedure with the outgoing crew and at each point where a lock or tag must be placed, and at each point where a lock or tag must be placed, the outgoing crew will remove their locks/tags and the incoming crew will attach theirs.

### **Removing Locks or Tags when Authorized Employee is Unavailable**

If an authorized employee who applied a lock or tag is not present to remove it, use the following procedure if the lock or tag must be removed:

1. The Director of Facilities and Operations shall ensure that the authorized employee whose lock or tag must be removed is not at the workplace.
2. The Director of Facilities and Operations shall use the spare key located in the locked credenza in the facilities office to remove the lock and/or to remove the information tag.
3. All reasonable efforts shall be made to contact the authorized employee to tell him/her that the lock or tag has been removed.
4. The Director of Facilities and Operations shall ensure that the authorized employee has been informed before resuming work at the workplace.

### **Outside Contractors**

Whenever an outside contractor does work at this workplace which requires the use of a lockout procedure, Yakima Valley Community College will exchange information with the

contractor about the energy control programs of each organization. The college will also inform its authorized and affected employees about any differences in the procedures of the two organizations that might cause confusion. It is the responsibility of the outside contractor to ensure that its employees comply with the restrictions and prohibitions of the energy control procedures of the college.

### **Training**

The Director of Facilities and Operations will provide training to all employees as outlined below. A training record will be maintained to document that each employee has received the appropriate training and refreshers.

1. Each authorized employee will be trained to recognize the types and magnitudes of energy used at this workplace along with the methods of isolation and control as described in this program, the particular written energy control procedures that the employee will use, and the requirements of WAC 296-24-110.
2. Each affected employee will be instructed in the purpose and use of the energy control procedure.
3. All other employees whose work may take them into an area where lockout is in progress will be instructed about the procedure and prohibited from attempting to start or operate machines or equipment which is locked or tagged out.

### **Energy Control Procedure Inspections**

Yakima Valley Community College will conduct annual inspections of the written energy control procedures to ensure that each procedure is being followed and that each procedure is providing adequate protection for employees. An authorized employee will be designated as inspector for those energy control procedures that (s) he does not use. The inspector will review the procedure with each authorized employee who uses the procedure and also with affected employees if the procedure uses a tagout rather than a lockout. The inspector will identify any deviations or inadequacies of the procedure and the procedure will be modified and/or additional training will be provided as needed. A written record of the inspection will be kept, including the identifying numbers of the machine or equipment on which the procedure was used, the date of inspection, the names of employees included in the inspection, and the inspector's name.

### **General Lockout Procedure**

This lockout procedure shall be used when performing service or maintenance on any machine or equipment for which accidental start-up could cause injury to employees. This procedure shall **not** be used when the machine or equipment has multiple energy sources and isolating devices, or when the machine or equipment cannot be locked out. In that case, a specific lockout or tagout procedure must be written for that machine or equipment.

### **Authorization**

A list of currently trained and authorized employees is maintained in the Plant Office, ext. 2856. Failure to use this procedure by an unauthorized employee will result in disciplinary action as described in the Energy Control Program.

### **Lockout Procedure Steps**

1. Notify affected employees that the machine or equipment is going to be locked out for service or maintenance.
2. Turn the machine or equipment off using the normal operating controls.
3. Identify the energy source, magnitude, and the location of the energy-isolating device

**WARNING: If more than one energy source is identified, or if there is stored, residual, or re-accumulated energy, this is the wrong procedure! Use the specific procedure written for this equipment.**

4. Deactivate the energy-isolating device so that the machine or equipment is isolated from the energy source.
5. Each authorized employee working on the equipment shall apply his/her lock and information tag to the energy isolation device.
6. Verify that the machine or equipment is disconnected from the energy source by first checking that no employees are exposed, then operating the normal controls or otherwise testing to ensure that the machine or equipment will not operate.

**CAUTION: Return all operating controls to the neutral or 'off' position after verifying the isolation of the equipment.**

The equipment is now locked out. If it is necessary at any time to temporarily energize the equipment for testing or positioning purposes, then use the following steps:

1. Clear the equipment of all tools, materials, and employees.
2. Remove the lockout device(s).
3. Energize and proceed with testing or positioning.
4. De-energize the equipment and reapply the lockout device(s) using the procedure steps above immediately after testing or positioning.

#### **Release from Lockout**

1. Inspect the work area to make sure that all tools and materials have been removed and that all guards are in place.
2. Check that all employees are safely out of the way.
3. Verify that the normal operating controls are in the 'off' position.
4. Each authorized employee removes his/her lockout device and information tag.

**NOTE: If an authorized employee is not available to remove his/her lock, the Director of Facilities and Operation shall be contacted and the procedure listed in the Energy Control Program shall be followed before removing any lock(s).**

5. Re-energize the equipment.
6. Notify any affected employee that the servicing or maintenance is complete and that the equipment is ready for use.

#### **Hand and Power Tools**

Employees will use proper tools suitable to the job being done; only safe tools in good repair may be kept or used on the premises or on the job. Employee owned tools used at work must be in good repair and meet all safety requirements.

## **Hand Tools**

Using the proper tool for the job is essential. The following guidelines apply to all tools, equipment and their operation.

**Cutting tools** must be kept sharp. Exercise caution when using sharp cutting instruments, especially when encountering resistance. Cut, if possible, away from the body.

**Hammers** and other tools having separable handles must have the handle securely fastened to the tool.

**Wrenches** having jaw openings at right angles or less than 180 degrees to the handle must be placed on the nut with the jaw opening in the direction the handle is to move. Use the correct size wrench and test for slippage on the nut before exerting pressure. Don't use a piece of pipe or a "cheater" to extend the handle for leverage; use a larger wrench. Be aware of equipment torque specifications. Wrenches with cracked or spreading jaws must not be used.

**Screw Drivers.** The tips of screw driver blades should be sharpened. They should be properly dressed to fit screw slots. A screwdriver must not be used as a cutting tool.

Tools with **mushroomed heads** must not be used.

**Ram Set Tools.** No employee may operate a ram set tool without a valid operator's license.

## **Insulation and Electrical Work**

Handles of tools such as pliers, screw drivers and similar tools may be covered with insulation for improvement of grip or to avoid unexpected short circuits, but this covering must not be relied on for insulation or protection against personal injury on voltages above 250 volts.

Screwdrivers having metal shanks extending through the handles must not be used for electrical work.

Metallic tapes or metallic rules must not be used near electrical equipment. Cloth tapes with metal reinforcing will be considered metallic tapes.

## **Tool Storage**

Tools temporarily stored or laid aside on the job must be placed so as not to create a stumbling, falling or similar hazard. They may not be left on ladders or in traffic areas. Tools with sharp edges must be covered or stored in such a way as to guard against a cutting hazard.

Particular care must be used when working in an elevated position. Tools must not be left unsecured. They must be kept in containers.

## **Electrical Tools and Equipment**

### **Extension Cords and Trouble Lights**

Extension cords used for lighting supply must be of a type that have conductors enclosed in common rubber sheaths and must be waterproofed for their entire length except at terminals.

Ordinary twisted lamp cords and metallic sockets do not meet these requirements. Lamps for trouble lights must be enclosed in guards.

Lamp guards must be gas-proof on trouble lights used in possible explosive atmospheres. Lamp guards must be of non-conducting material on trouble lights used in location with exposed electrical contact points.

### **Electrical Power Cords**

All power cords must be three conductor type with proper ground plug (UL approved) enclosed in common rubber waterproof sheaths.

All power tools must be insulated and properly grounded with three conductor type cords and ground plug.

The plug on power or extension cords must not be tampered with. The ground connection on the power plug must not be cut off or removed at any time.

Extension cords that are frayed, worn or with missing ground prongs must not be used. Extension cords must have sufficient capacity for the portable power electric tool to be used.

### **Portable Electric Tools**

Electric cords supplying portable power tools must be rubber sheathed with adequate terminal connections, and must include a ground wire attached to the tool casing and to an outlet ground or other low resistance ground.

Portable electric power tools must be grounded. If double insulated tools are used, they must be distinctively marked.

The user must thoroughly inspect portable electric power tools and cords before use. Extension cords must not be used in lieu of fixed wiring.

Employees using portable electric power tools should first assure themselves of a firm stance, and secure the piece being worked on in such a way as to prevent unexpected turning or other movement.

Portable electric power tools with frayed or worn cords, missing ground prongs or lose or worn parts may not be used.

### **Accident Prevention Tags**

Do not use any machinery, tool, material, or equipment which is not in safe operating condition.

Unsafe machines, tools, materials or equipment should be identified as unsafe by tagging or locking the controls (if applicable), and notifying the supervisor.

The tag should indicate the name of the person placing the tag, the nature of the problem and the date. When the unsafe condition is corrected the tag and/or lock can be removed and the tool or equipment returned to service.

### **Power Equipment**

Always shut off power when finished using a piece of equipment even if you have to leave for a short period of time. Approved eye protection must be used when working with grinders or equipment that might project particles.

### **Bench Grinder**

The tool support must be positioned at or above the center line of the wheel and be kept as close to the wheel as possible without touching but never more than 1/8 inch away. Use the face and not the side of the wheel for grinding. The grinding wheel must be checked for cracks, breaks, or defects and defective wheels reported to the supervisor. Small items should be held with pliers to keep hands away from the wheel.

### **Portable Grinders**

Immediately before mounting, all wheels must be closely inspected and sounded by the user (ring test) to make sure they have not been damaged in transit, storage, or otherwise. Wheels should be tapped gently; if they sound cracked (dead) they must not be used.

*Note: Wheels should be tapped gently with a light non-metallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels. This is known as the "ring test."*

### **Drill Press or Lathe**

Always remove the key from the chuck; never allow it to remain in the chuck. Check the speed, drill bit or tool to make sure it matches the size, thickness or type of material being machined. Drill bits and cutting tools must be kept sharp. Too fast a speed may break, overheat or damage the bit or tool. Proper eye protection is required when using this equipment.

### **Power Cutoff Saw**

Approved eye protection and ear protection must be worn when performing operations using the power cutoff saw. Those working in close proximity to the power cutoff saw or grinders should also use personal protective equipment.

The upper hood must completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The sides of the lower exposed portion of the blade must be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock being cut to give maximum protection possible for the operation being performed.

### **Circular or Chain Saws**

All hand-held powered circular saws having a blade diameter-greater than 2 inches, without positive accessory holding means must be equipped with a constant pressure switch or control that will shut off the power when the pressure is released. All hand-held gasoline powered chain saws must be equipped with a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.

### **Band saw**

The guard must be kept in proper condition. All portions of the saw blade must be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and

the table. Band saw wheels must be fully encased. The front and back of the band wheels must remain either enclosed by solid material or by wire mesh or perforated metal. Such mesh or perforated metal must be not less than 0.037 inch (U.S. Gage No. 20), and the openings must be not greater than three-eighths inch.

Solid material used for this purpose will be of an equivalent strength and firmness. The guard for the portion of the blade between the sliding guide and the upper-saw-wheel guard will protect the saw blade at the front and outer side. This portion of the guard must be self-adjusting to raise and lower with the guide. The upper-wheel guard must conform to the travel of the saw on the wheel, and the top member of the guard should have at least a 2-inch clearance outside the saw and be lined with smooth material, preferably metal. Effective brakes should be provided to stop the wheel in case of blade breakage.

The bandsaw must have a tension control device to indicate a proper tension for the standard saws used on the machine, in order to assist in the elimination of saw breakage due to improper tension.

Feed rolls of bandsaws must be protected with a suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The edge of the metal guard must come to within three-eighths inch of the plane formed by the inside face of the feed roll in contact with the stock being cut.

### **Press Operations**

Presses must only be used for their intended purpose. Presses must be clearly marked with the manufacturer's stated load capacity, with the rating visible from the point of operation.

**Instruction to operators.** Operators must be trained and instructed in the safe methods of operation before starting work on a press. The employee will be supervised to insure correct use of safe procedures.

**Work area.** Employees must maintain adequate clearance between machines so that movement of one operator will not interfere with the work of another. Ample room for cleaning machines, handling material, work pieces, and scrap must also be maintained. All surrounding floors must be kept in good condition and free from obstructions, grease, oil and water.

**Overloading.** Presses may only be operated within the tonnage and weight ratings specified by the manufacturer.

**Freedom from movement.** Work being pressed must be free from slippage or unintended movement.

### **Batteries**

No smoking around the tops of batteries or in the vicinity of a battery which is being charged. Explosive fumes may be emitted during charging or operating batteries and all potential sparks or flames must be kept away from the top of any liquid cell battery. Do not disconnect the cables while the charger is running.

### **Fixed and Portable Woodworking Machines**

This section applies to the use of fixed and portable power tools for processing materials that generate chips or dust from wood, reconstituted wood products, or plastics in the processing of a wood piece.

#### **Definitions**

**“Point of operations”** means that point at which cutting, shaping, boring, or forming is accomplished upon the stock.

**“Push stick”** means a narrow strip of wood or other soft material with a notch cut into one end and which is used to push short or narrow pieces of material through saws.

**“Block”** means a short block of wood, provided with a handle similar to that of a plane and a shoulder at the rear end, which is used for pushing short stock over revolving cutters.

**“Jigs and Fixtures”** are devices for holding, supporting or restraining material from movement while operations are being performed.

#### **General Woodworking Machine Construction**

Each machine should be so constructed as to be free from sensible vibration when the largest size tool is mounted and run idle at full speed.

Arbors and mandrels should be constructed so as to have firm and secure bearing and be free from play.

Saw frames or tables should be constructed with lugs cast on the frame or with an equivalent means to limit the size of the saw blade that can be mounted, so as to avoid excessive speed caused by mounting a saw larger than intended.

Circular saw fences should be so constructed that they can be firmly secured to the table or table assembly without changing their alignment with the saw. For saws with tilting tables or tilting arbors the fence should be so constructed that it will remain in a line parallel with the saw, regardless of the angle of the saw with the table.

Circular saw gages should be so constructed as to slide in grooves or tracks that are accurately machined, to insure exact alignment with the saw for all positions of the guide.

Hinged saw tables should be so constructed that the table can be firmly secured in any position and in true alignment with the saw.

All belts, pulleys, gears, shafts, and moving parts should be guarded.

It is recommended that each power-driven machine be provided with a disconnect switch that can be locked in the off position.

The frames and all exposed, non-current-carrying metal parts of portable electric machinery operated at more than 90 volts to ground should be grounded and other portable motors driving electric tools which are held in the hand while being operated should be grounded if

they operate at more than 90 volts to ground. The ground should be provided through use of a separate ground wire and polarized plug and receptacle.

Combs (feather boards) or suitable jigs should be provided at the workplace for use when a standard guard cannot be used, as in dadoing, grooving, jointing, molding and rabbeting.

### **Table Saw**

The table saw guard must completely enclose that portion of the saw above the table and that portion of the saw above the material being cut. The hood and mounting must be arranged so that the hood will automatically adjust itself to the thickness of and remain in contact with the material being cut without offering any considerable resistance to the insertion or passage of material being sawed.

The hood must be strong enough to resist blows and strains incidental to reasonable operation, adjusting, and handling. It must also protect the operator from flying splinters and broken saw teeth. It must be made of material that is soft enough so that it will be unlikely to cause tooth breakage. The material should not shatter when broken, should be non-explosive, and should be no more flammable than wood. The hood must be so mounted as to insure that its operation will be positive, reliable and in true alignment with the saw. The mounting must be adequate in strength to resist any reasonable side thrust or other force tending to throw it out of line.

### **Unusual Shapes**

When a hood-type guard cannot be used because of unusual shapes or cuts, a jig or fixture that will provide equal safety for the operator must be used. Combs (featherboards) or suitable jigs must be used when a standard guard cannot be used, as in dadoing, grooving, jointing, molding, and rabbeting. On the completion of such operations, the guard must be immediately replaced.

### **Push Stick**

A push stick must be used on short or narrow stock or when there is a possibility of the hand contacting the blade.

### **Spreader and Anti-kickback Devices**

Each table saw should be furnished with a spreader to prevent material from squeezing the saw or being thrown back on the operator. The spreader should be made of hard tempered steel, or its equivalent, and should be thinner than the saw kerf. It should be of sufficient width to provide adequate stiffness or rigidity to resist any reasonable side thrust or blow tending to bend or throw it out of position. The spreader should be attached so that it will remain in true alignment with the saw even when either the saw or table is tilted, and should be placed so that there is not more than 1/2-inch space between the spreader and the back of the saw when the largest saw is mounted in the machine. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required. On the completion of such operations; the spreader should be immediately replaced.

### **Radial Arm Saws**

The radial arm saw may be guarded with a fixed enclosure, fixed barrier guard, or a manually adjusted guard or a standard automatic adjusting guard. In those instances where an alternate

fixed-type guards is used, it must provide protection equivalent to the protection afforded by the automatically adjusting guard.

The upper hood should completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The upper hood should be constructed in such a manner and of such material that it will protect the operator from flying splinters, broken saw teeth, etc., and will deflect sawdust away from the operator. The sides of the lower exposed portion of the blade should be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock being cut to give maximum protection possible for the operation being performed.

An adjustable stop should be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut.

Installation should be in such a manner that the front end of the unit will be slightly higher than the rear, so as to cause the cutting head to return to the starting position in the following manner when released by the operator:

- The cutting head or carriage should return to the rest or starting position in a gentle motion.
- The cutting head or carriage should not bounce or recoil when reaching the rest or starting position.
- The cutting head or carriage will remain in the rest or starting position.

Each radial arm saw used for ripping should be provided with non kick-back fingers or dogs located on both sides of the saw so as to oppose the thrust or tendency of the saw to pick up the material or to throw it back toward the operator. They should be designed to provide adequate holding power for all the thickness of material being cut. Ripping and ploughing must be against the direction in which the saw turns. The direction of the saw rotation must be conspicuously marked on the hood. In addition, a permanent label not less than 1 1/2 inches by 3/4 inch with standard proportional lettering should be affixed to the rear of the guard hood at approximately the level of the arbor, where the blade teeth exit the upper hood during the operation of the saw, reading as follows: "Danger: Do not rip or plough from this end." Such a label should be colored standard danger red.

### **Jointer**

The planer or jointer cutting head knife must not project out greater than one-eighth inch beyond the cylindrical body of the head.

The opening in the table must be kept as small as possible. The clearance between the edge of the rear table and the cutter head must not be more than one-eighth inch. The table throat opening must not be more than two and one-half inches when tables are set or aligned with each other for zero cut.

The jointer guard must cover all the section of the head on the working side of the fence or gage. The guard must effectively keep the operator's hand from coming in contact with the revolving knives. The guard must automatically adjust itself to cover the unused portion of the head and must remain in contact with the material at all times.

The jointer guard must cover the section of the head back of the gage or fence.

### **Shaper**

The cutting head of the shaper must be enclosed with a cage or adjustable guard so designed as to keep the operator's hand away from the cutting edge. The diameter of circular shaper guards must be not less than the greatest diameter of the cutter. In no case is a warning device of leather or other material attached to the spindle be acceptable.

### **Planer**

The planer must have all cutting heads covered by a metal guard. If it's made of sheet metal, the material used must be not less than 1/16 inch in thickness, and if cast iron, it should be not less than three-sixteenths inch in thickness.

Feed rolls should be guarded by a hood or suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The guard should be fastened to the frame carrying the rolls so as to remain in adjustment for any thickness of stock.

If the planers are used in thickening multiple pieces of material simultaneously, means must be provided to prevent kickback.

### **Sanding Machines**

Each drum sanding machine must have an exhaust hood, or other guard if no exhaust system is required, so arranged as to enclose the revolving drum, except for that portion of the drum above the table, if a table is used, which may be necessary and convenient for the application of the material to be finished.

Belt sanding machines should be provided with guards at each nip point where the sanding belt runs on to a pulley. These guards should effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt should be guarded against accidental contact.

### **Ladders**

Always inspect ladders carefully prior to each use. Never use a ladder which appears to be unsafe. The following is a brief description of some ladders and their uses:

#### **Step ladders**

A step ladder provides a reasonably stable base for carrying on work when both hands must be used. It is usually equipped with a pail shelf for tools and materials. The steps of the ladder in most cases are flat and wide enough for comfortable standing. These ladders are self-supporting with wide spread bases.

Step ladders should be used where the space in which the ladder is placed is sufficiently large to permit the proper placement of the ladder.

A step ladder is a temporary elevated base from which to work. It should not be used to move between different levels.

**Proper Use:**

The ladder should be placed on a firm, level base. If this requires blocking, then the blocking and the ladder must be firmly tied or anchored.

The ladder should be placed so that the work can be done without leaning or stretching past the side rails.

All step ladders should be opened fully so that the spreaders lock themselves in the open position.

If it is necessary to reach a greater height, use a longer ladder. It is dangerous to use boxes or other items to increase the height of a ladder.

Unless a ladder is equipped with a top platform and guardrails, operations should be conducted from no greater height than two steps from the top of the ladder.

Tools and materials should be removed from the top and pail shelf before the worker descends. Nothing should ever be left on a ladder.

**Straight, Extension & Fixed Ladders**

Straight ladders are used in places where a step ladder cannot be used due to limited space and heights greater than twenty feet. A straight ladder should not exceed thirty feet in length.

Extension ladders should not be more than sixty feet in total length, with a single section limited to thirty-one feet, and the total length limited to sixty feet.

**Proper Use:**

The procedures for the inspection and placement of step ladders apply to straight ladders. There is, however, an additional factor in placing a straight ladder properly. The base of a straight ladder must be placed at a distance from the vertical wall equal to one fourth the working length of the ladder.

Ladders must be long enough to extend at least 3 (three) feet above the top landing.

Straight ladders must always be placed so that the top of the two rails are against a solid support. They should be lashed, preferably at top and bottom, to prevent movement. If it is not possible to lash the ladder in position, a helper should hold the ladder firmly.

When it is necessary to work from a straight ladder, the highest level one may work from is the third rung from the top.

Extension ladders should be raised and lowered with care. The length of an extension ladder determines the number of personnel required for raising and lowering. Generally, it is permissible for one employee to raise or lower extension ladders up to 28 feet in length. Two employees are generally required for ladders 29 feet and up to 40 feet.

When raising a ladder with two people, lay the ladder on the ground with one person standing at the foot. The second person should raise the opposite end and "walk it up" to the vertical position. Then, braced securely by both people, the ladder may be extended and placed in position for use. To lower the ladder, reverse the procedure, raising the top first to clear the hooks.

Keep hands and fingers in the clear at all times to avoid crushing.

### **Using a Ladder**

Always face the ladder while ascending or descending it. Never carry materials or tools while climbing or descending a ladder except in an appropriate tool pouch. Always be certain that shoes are free of mud and grease to prevent falls.

### **Ladder Inspection**

Guidelines for proper inspection and maintenance of ladders are as follows:

#### **Inspecting Step Ladders**

Be sure that hinge spreaders are securely fastened to the ladder and can be opened to the fullest extent without binding.

Inspect steps to be certain that they are tight. A loose step is one that can be moved, even slightly, by hand. See that the ladder doesn't wobble or shake due to damage and side strain. Check safety feet for proper condition.

#### **Inspecting Straight Ladders**

Inspect the rails and rungs to be certain that they are not cracked, split or broken. Repair slivered or splintered areas.

On extension ladders, check the extension locks and pulley. A lock that is defective should be replaced. Check the rung sections exposed to wear by the action of the extension locks. See that the safety feet are in good condition and operating properly.

Determine that the extension locks are securely fastened in position to the side rail. If there is any indication of the side rail splitting at the bolt or rivet holes, remove the ladder from service. Inspect the connecting joints of sectional ladders. The metal plate of the grooved ends of the sections should be rigidly secured in position, and the rivet or bolt should be positioned firmly.

Check the outside rung extensions at the top of each section to determine that there is no deterioration, cracking, or loosening of the rung. All members of each section and its support should be sound and firmly secured.

Before using a ladder, carefully inspect it to determine whether it is in sound condition. If there is any defect no matter how slight, withdraw it from use immediately. Have the ladder inspected by a qualified person, and if it cannot be placed in perfect condition, destroy it. Substandard ladders should never be kept.

All portable ladders should be kept coated with a protective material such as paint, varnish, lacquer, etc. Paint is a satisfactory coating for a new ladder if a careful inspection is made by an experienced person and the ladder is not to be sold. Ladders should not be placed in front of doors opening toward the ladder unless the door is blocked open, locked shut, or guarded by a worker.

Ladders should never be lengthened by splicing additional sections to them. The only ladder that can be spliced is a fixed ladder that is permanently installed to a structure. Unattended ladders should never be left standing. They should be closed and lowered to the ground or floor.

### **General Hoisting and Crane Requirements**

Only designated personnel are permitted to operate a campus lifting or hoisting device. Prior to initial use all new and altered equipment must be inspected to insure that it is safe and in proper operating condition. Rated capacity of slings, ropes and equipment must not be exceeded. The rated capacity of a rope or sling often is reduced to 50% when the angle of loading approaches 60 degrees from the vertical.

### **Maintenance Procedure**

Any unsafe conditions disclosed by an inspection must be corrected before operation of the hoist or lift is resumed. Adjustments and repairs may be done only by designated personnel.

After adjustments and repairs have been made the crane may not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed.

### **Load Limit**

The manufacturers recommended load limit must be clearly displayed on the hoisting device or crane. The rated load limit must never be exceeded. The manufacturers recommendations must be followed. Allowance must be made for windy conditions and work suspended when severe.

### **Equipment Guards**

Guards must be securely fastened. Each guard will be capable of supporting without permanent distortion, the weight of a two hundred-pound person unless the guard is located where it is impossible for a person to step on it.

Railings must also be able to withstand a 200 pound force in a horizontal direction without deflection. Railings on vertical lifts must meet the requirements of a standard guard rail. A standard guard rail consists of a top rail, intermediate rail, toe board, and posts, and has a vertical height of 36 inches to 42 inches from upper surface of top rail to the floor or platform. Each length of railing must be smooth-surfaced throughout the length of the railing. The intermediate rail is located halfway between the top rail and the floor or platform.

**Hooks:** Hooks must meet the manufacturer's recommendations and must not be overloaded. Safety latch type hooks must be used.

### **Refueling Self Propelled Equipment**

Refueling with portable containers may only be done with approved safety type containers equipped with automatic closing spout and flame arrester. A container is "approved" if it is listed or approved by one of the following:

1. Factory Mutual Engineering Corp.
2. Underwriters' Laboratories, Inc.
3. Mine Safety and Health Administration (MSHA)
4. National Institute for Occupational Safety and Health (NIOSH)
5. Department of Transportation or
6. U.S. Coast Guard

Machines may not be refueled with the engine running.

### **Operating near Electric Power lines**

Employees lift equipment or devices of any kind may not approach nearer than 10 feet to any power line (under 50,000 volts).

### **Fire Extinguishers**

A carbon dioxide, dry chemical or equivalent fire extinguisher must be kept in the truck cab or vicinity of lift equipment. Operators and maintenance personnel will be made familiar with the use and care of the fire extinguishers provided.

### **Operators**

Training is required before operating any aerial lift equipment (vertical lift, forklift...etc.). Each operator must be familiar with the manufacturer's recommendations, safe practices and equipment limitations. Annual refresher training may be required.

### **Alloy Steel Chains**

Chains used for overhead lifting must be proof tested alloy steel. Welded alloy steel chain slings must have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, must have a rated capacity at least equal to that of the chain. The use of job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments are prohibited.

If at any time any three foot length of chain is found to have stretched one-third the length of a link it must be discarded. The practice of placing bolts or nails between two links to shorten chains is prohibited.

Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or passing one link through another and inserting a bolt or nail to hold it, is prohibited. Annealing of chains is prohibited.

### **Wire Rope**

Only wire ropes may be used that have a capacity exceeding 5 times the manufacturers recommended safe working load for a particular lifting job. Protruding ends of strands in splices on slings and bridles must be covered or blunted. Wire rope must not be secured by knots.

**Limitations.** The following limitations apply to the use of wire rope:

An eye splice made in any wire rope must have not less than three full tucks.

*Note: This requirement does not preclude the use of another form of splice or connection which can be shown to be as efficient and which is not otherwise prohibited.*

Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in pulling loads, must consist of one continuous piece without knot or splice.

Wire rope may not be used, if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.

### **Natural Rope, And Synthetic Fiber**

Natural or synthetic fiber ropes must be inspected for wear, mold or damage before each use. They may only be used if the manufacturers recommended load capacity exceeds the load by a factor of 5 times.

### **Portable Cranes (Cherry Pickers or Boom Hoists)**

The capacity must be clearly marked and never exceeded. Periodic inspection for cracks or other evidence of wear or damage should be conducted and recorded.

### **Cranes, Supports and Jacks**

All cranes, jacks, supports and lift equipment should be marked with the manufacturers rated load limit. The rated load limit of the crane, support, jack...etc. must never be exceeded. Hoisted or jacked equipment must be secure from movement before working on it. Equipment must be properly blocked and thoroughly supported before work may be performed under it. Check to insure everyone is clear before lowering equipment onto blocks or supports. Only approved chains, cables or slings may be used for lifting equipment.

Wooden blocks should be placed between the metal jack-stands and metal equipment to prevent slippage or movement.

### **Jack Types**

A jack is an appliance for lifting and lowering or moving horizontally a load by application of a pushing force.

*Note: Jacks may be of the following types: Lever and ratchet, screw and hydraulic.*

**Rating.** The rating of a jack is the maximum working load for which it is designed to lift safely that load throughout its specified amount of travel.

The operator must make sure that the jack used has a rating sufficient to lift and sustain the load.

The rated load must be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means.

### **Compressed Air Use**

Compressed air may not be used for cleaning purposes except where reduced to less than 30 p.s.i. at the point of operation and then only with effective chip guarding and personal protective equipment.

### **Compressed Air Tools**

In the use of compressed air tools, care should be used to prevent the tool from being shot from the gun.

When momentarily out of use the gun should be laid in such position that the tool cannot fly out if the pressure is unexpectedly released. When not in use, all tools should be removed from the gun.

In disconnecting a compressed air tool from the air line (portable air compressor), care should be exercised first to shut off the pressure and then to operate the tool to exhaust the pressure remaining in the hose. Tools using quick release couplings may be detached without shutting off the pressure.

Compressed air hose or guns must not be pointed at or brought into contact with the body of any person.

### **Pneumatic Powered Tools and Hose**

The operating trigger on portable hand-operated utilization equipment must be so located as to minimize the possibility of its unanticipated operation and must be arranged to close the air inlet valve automatically when the pressure of the operator's hand is removed.

A tool retainer must be installed on each piece of utilization equipment which, without such a retainer, may eject the tool.

Hose and hose connections used for conducting compressed air to utilization equipment must be designed for the pressure and service to which they are subjected.

Only the valve should be used to turn off air pressure. Never crimp the hose to shut off the pressure.

### **Structures and Overhead Work**

Where overhead work is in progress protective measures must be initiated to prevent tools or other objects from falling and contacting those below. Hard hats must be worn wherever working beneath other workers or equipment or if there is a possibility of injury from falling objects.

## Lifting

### Lifting Injuries

Yakima Valley Community College is committed to helping reduce back injuries at work by emphasizing good lifting techniques, but basic safety is a shared responsibility—it requires your constant awareness of these techniques whenever you lift, both on and off the job.

### How to Lift Properly

Assume a stable stance and check for firm footing before lifting. The feet should be kept apart with one foot positioned in front of the other, toes pointed out.

Knees should be bent; don't bend at the waist. Keep the principles of leverage in mind at all times.

Don't lift more than you are capable of safely lifting. Use dollies, hand trucks or other material handling devices when appropriate to lift heavy, bulky or awkward items.

Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load. Train muscle groups to work together.

Lift with your legs. Let your powerful leg muscles do the work of lifting, not your weaker back muscles.

Keep load close. Don't hold the load away from your body. The closer it is to your spine, the less force it exerts on your back.

Keep your back upright. Whether lifting or putting down the load, don't add the weight of your body to the load. Avoid twisting the torso while lifting. Move the feet if it is necessary to turn.

There is a growing body of evidence that the use of back supports may contribute to increased back injuries in some cases and a recent study by NIOSH (the research arm of OSHA) has confirmed these findings.

Therefore, some are suggesting that if “back supports” or “lifting supports” are worn when performing lifting tasks, wearers should be aware that the “back support” should only serve as a reminder to lift properly, using proper lifting techniques. It should not be used to attempt to lift beyond what the person is normally able to lift safely without it. Instruction or training in the proper use of lifting devices is advised.

### How to Avoid Lifting Injuries

Know Your Strength: Get the assistance of a second person whenever needed.

Plan Ahead: Find a place to put what you're carrying. Do doors need to be opened? Are there any obstacles in your path?

Be sure your footing is secure: One foot can be forward of the other to attain good balance.

Lift and carry the right way:

1. Use arm and leg muscles: This means keeping your back straight and the load close to your body.
2. Grasp object firmly: Hold it so that your fingers won't be pinched if the load should shift.
3. Be sure you can see: Have plenty of light and be able to look over your load.
4. Set object down using arm and leg muscles: Rest one corner first so hands don't get caught underneath.

## **Office Shipping and Receiving**

### **Safety Is Important**

Safety in the office, shipping & receiving areas is like safety anywhere else. It doesn't just automatically happen but it's the result of the individual effort of everyone concerned.

Many mishaps in offices nationwide stem from the fact that these areas are frequently considered non-hazardous areas and therefore safety is often not emphasized. The following are some suggestions to help reduce some of the hazards found in these areas.

### **Some General Tips**

Come to work rested: Fatigue is a frequent factor in mishaps. It can cause a person to lose concentration, become distracted or fail to give full attention to their work.

Think about safety and follow safety rules: Before doing something, ask yourself if what you are about to do is going to be safe for yourself or others. In this way, safe work habits can develop quickly.

No practical jokes: This causes many mishaps. They have no place in the work area and should be avoided.

Know your emergency procedures: Fire, first-aid and emergency numbers.

### **How to Avoid Lifting Injuries**

Know your strength: Get the assistance of a second person whenever needed.

Plan ahead: Find a place to put what you're carrying. Do doors need to be opened? Are there any obstacles in your path?

Be sure your footing is secure: One foot can be forward of the other to attain good balance.

Lift and carry the right way: See Chapter 5.

### **Preventing Mishaps Caused by Falling**

Keep the floor clean: Small or loose objects can cause someone to slip, trip or fall.

Use aisles: Avoid taking short cuts between desks when wastebaskets, phone and extension cords or other objects are located there.

Keep file and desk drawers closed: Especially if they are left unattended.

Watch your step: Don't read while walking, nor obstruct your vision with tall loads. Report burned out lights promptly.

Wipe up wet spots: Carry beverages in covered containers or on trays to help prevent spills.

Foot Protection: Wear shoes that protect from cuts, crushing, liquids or slipping. In offices, lower heels are less fatiguing.

Keep chairs solidly on the floor: Tilting back in chairs can cause injuries.

### **Preventing Filing and Storage Accidents**

Avoid overloading top drawers: That can bring the cabinet down on you. Too much weight near the front of a drawer can also cause overbalancing.

Close one drawer before opening another: Prevents bangs on the head or unexpected trips.

Close drawer gently using handles: Fingers can get pinched if you use top or sides of drawers.

Don't struggle with stuck drawers or doors: That's an easy way to cause back injury or bring everything down on you - if stuck, get assistance and have it repaired.

Don't stand on chairs, boxes or other unstable objects: These could slip out from underneath you, causing you to fall and hurt yourself.

### **Preventing Machine Accidents**

Know-how: Read instructions or listen to them carefully. Never use machines you don't know how to operate.

Be sure mechanical guards are in place every time you use a machine: If a machine guard has been temporarily removed be sure it's replaced before using the machine. Watch your hands and use caution.

Turn machines off before: Making adjustments, applying flammable solutions (only if needed) or whenever leaving a machine, even for a minute.

Be alert for electrical hazards: Electric current is capable of causing injury or death. If a machine overheats, smokes or sparks, or you feel even a slight shock, unplug it and have it repaired.

Check machine position before use: Typewriters, fax machines, photocopiers, and adding machines should be firmly on the working surface.

Keep liquids away from electrical machines, keyboards or chords: Electricity and water do not mix.

Electric Fans: Do not remove protective guards from fans. Ensure that fan guards have openings no larger than one-half inch. Do not place fans in aisles and doorways.

### **Preventing Supply Room Accidents**

Good housekeeping: Cleanliness makes work easier and conditions safer. Keep aisles clear and shelves orderly with materials secure.

Store chemicals and flammables: Carefully label them and seal in approved containers (see hazard communication plan)

Dispose of shipping and packing materials: Loose debris can cause falls and is a fire hazard.

Opening packages: The safest way is to inspect for sharp projections and rough edges. Cut away from body, use right tool for the job.

Use ladders: Don't rely on chairs or shelves for support. Use a ladder that is sturdy, with the feet set firmly on the ground. Face the ladder when climbing, avoid stretching, get off the ladder to move it and avoid carrying more than you can safely handle.

### **Preventing Cuts and Punctures**

Utility knives & other cutting instruments: Care should be taken around hands or in unusual positions. In most cases cutting away from your hand or body is the preferred method.

Sharp or pointed objects: Store them separately, in a drawer.

Paper cutters: Require attention- guards work- don't cut too many sheets at one time.

Broken glass: Sweep up pieces instead of picking them up by hand. Glass splinters can be picked up with a damp towel.

Bloodborne safety concerns: If broken glass, clothing or objects have blood on them, place them in an approved hazardous container for proper handling and disposal. (See bloodborne pathogen plan)

### **Fire Prevention**

Keep used cigarettes and matches off the floor and out of wastebaskets.

Smoking is not permitted where any flammable liquid is being used.

Outlets and extension cords should not be overloaded. If plugging in heavy equipment, check the adequacy of the circuit.

Identify cord insulation damage. Inspect and report any damage to switches, fixtures, and wires.

Three prong plugs provide protection from shock. Keep electrical equipment properly grounded.

Know where fire extinguishers are located and know how to use them!

Know the location of fire exits.

## **Video Display Terminals (VDT)**

“Ergonomics” is the study of how people interact with machines. When workplace design is fitted to the needs and capabilities of employees, comfort and productivity are at their highest. Every individual and working situation is different, and not every factor in the workplace can be changed. Look for ways to increase ergonomic efficiency of equipment and operations where possible. Here are some general guidelines that you can follow to make your VDT experience less demanding on the eyes, body and mind.

### **VDT Definition**

A video display terminal (VDT) is a component of a computer system. A VDT is a television-like screen. An operator types information on a keyboard and the computer displays the information on the VDT.

This section provides information related to the impact of VDT equipment on employee health and provides guidelines for the length of work sessions for an employee working on a VDT.

### **VDT Health and Comfort Issues**

The Federal Food and Drug Administration (FDA) regulate the manufacture of video display terminals. A radiological control group within the FDA conducts studies and surveys to ensure that terminals sold to the public meet all safety standards for radiation levels. Studies thus far, including those by the US. Food and Drug Administration and National Institute for Occupational Safety and Health (NIOSH), have found “VDT radiation to be well within levels currently considered safe”.

NIOSH measured radiation emissions for machines now in use and concluded that the radiation levels emitted by a VDT are “very low compared to current occupational exposure standards. In many cases, the emission levels are below the detection capability of the survey instrumentation used.” Based on the survey data, NIOSH concluded that the VDT does not present a radiation hazard to the employee.

### **Other Health and Comfort Issues**

#### **Vision**

Contrast: This can cause visual discomfort and reduce reading skills because the eye must continually adjust to the brightness between the screen and the surrounding environments.

Glare: This is the reflection of light, shiny surfaces, or clothing on the screen. The glare image and the VDT image are at different optical distances and the eye attempts to focus on both images at the same time which causes visual fatigue.

#### **Musculo-skeletal**

Fatigue to a specific muscle or muscle group results from uninterrupted use of a VDT. VDT operators may report muscular-skeletal discomfort in the neck, shoulders, back, arm, and hands, this discomfort may be attributed to poor workstation design, repetitiveness of the task, extended duration of a postural constraint, distractions in the workplace, inappropriate work/rest schedule, and personal attributes of individual workers.

## **Corrective Action**

The National Institute for Occupational Safety and Health (NIOSH) recommends interruption of continuous VDT work with periodic rest breaks or other work activities that do not produce visual fatigue or muscular tension. As a minimum, the employee should take a break after every two hours of continuous VDT work and more frequently as visual, mental, and muscular burden increases. Other corrective measures are:

Maintain good posture: To prevent neck and back strain, keep your spine and head upright, and sit well back into your chair. Placing your feet on a footrest helps take the strain off your legs and back.

Correct hand and wrist placement: Shoulder muscles can become tense when arms and hands are held too high. Hold arms comfortably at your side, with your upper arm and forearm at about a right angle. Wrists should be in line with the forearm; wrist problems can develop if they are bent at extreme angles.

Use of hand, wrist or arm supports: These have proven useful in reducing or relieving physical stresses in certain working environments. Wrist or arm supports have been beneficial in jobs requiring long periods of keyboard operation.

Good eye care: focusing at close range for long periods of time can sometimes cause blurred vision or eye soreness. To lessen the strain on eye muscles, keep your VDT screen at least 18 to 28 inches from your eyes (or farther away than you might hold a book). Itching and burning may be caused by dryness, so blink slowly now and then to keep your eyes moist.

Good lighting: More lighting is not better when it comes to VDT work. Less lighting is required when working with lit characters on a VDT screen. High levels of lighting contribute to screen glare and reflection-and thus, to eye strain and discomfort. Indirect lighting is the best light for VDT work.

Properly designed chair: It has a seat that curves down in the front, support for the lower back, and a height that can be changed to suit different users. Knees should be at about the same level as the hips.

Periodic breaks: Scheduled breaks following long periods of uninterrupted terminal work are most helpful when they include stretching, moving of hands, fingers, arms and wrists in a variety of other positions and gentle rubbing of hand and arm muscles. Rest breaks can help ease the muscle aches, eye strain and mental stress that often accompany VDT work. Research shows that short, frequent breaks taken before you get tired are more effective than longer, less frequent breaks taken after you get tired.

Positioning work: To help prevent slouching in your neck, try angling your work materials up toward vertical, so you don't have to lean over your desk.

Posture: Users should also stretch and change their posture from time to time to help reduce fatigue and stress.

### **Environmental Tobacco Smoke in Offices**

The Department of Labor and Industries has defined environmental Tobacco Smoke (ETS) as "a mixture of smoke emitted from burning tobacco products and smoke exhaled by the smoker. ETS is also commonly referred to as second-hand smoke. Exposure to ETS is often referred to as passive smoking or involuntary smoking. ETS is a complex chemical mixture, made up of thousands of different substances.

Smoking in campus buildings or vehicles is prohibited.

## **Respiratory Protection**

### **Purpose**

The purpose of this section is to cover the safety procedures pertaining to entry into potentially hazardous atmospheres and use or care of respiratory protection. Use of equipment and respiratory protective measures must be covered by supervisors with employees.

### **Toxic Atmospheres**

The purpose of this respiratory program is to provide and maintain a safe and healthful workplace for all employees in those work assignments involving airborne contaminants. This chapter establishes entry procedures and provides instructions in the selection, use and care of respiratory protective equipment.

Whenever possible, toxic levels of contamination should be eliminated through administrative controls (for example, rescheduling crews until levels have been reduced) or engineering controls (such as, eliminating the hazard by substituting a less toxic material). When administrative or engineering controls are not feasible, or while they are being instituted or evaluated, appropriate respirators will be used.

### **Toxic Atmosphere Defined- PELs, STELs and Ceilings**

**PEL**- Permissible Exposure Level- an 8 hour Time Weighted Average (TWA) above which employees are not permitted to work without respiratory protection. The following formula may be used to determine if employees during a shift on a particular job site are approaching the PEL:

C = concentration- from test sampling data

t = length of time exposed (in hours)

$$C_1t_1 + C_2t_2 + C_3t_3...$$

shift exposure = 8 hours

**STEL**: Short Term Exposure Limit- a 15 minute TWA- employees are not permitted to work at or above this average concentration for 15 minutes or more without respiratory protection.

**Ceiling**: Employees are not permitted to work at or above this level for any period of time at all without respiratory protection.

**IDLH**: Immediately Dangerous to Life or Health- employees may only enter if the following three conditions have all been met:

1. They are using a supplied air type of protection,
2. The employee has been trained, and
3. The entry has been approved by the supervisor.

An area with ammonia vapor is IDLH if the concentration reaches 500 ppm.

### **Respirators and Equipment**

Employees that are exposed to hazardous levels of toxic fumes will be issued a respirator, with replacement parts, cartridges and filters as needed. Respiratory protection must be used whenever toxic or flammable atmospheric levels meet or exceed the Permissible Exposure Limit (PEL). Questions should be addressed to the supervisor.

### **Program Evaluation and Review**

An annual appraisal of the effectiveness of the respirator program will be carried out, and the program updated annually.

### **Atmospheric Testing**

Worksite atmospheric testing is required whenever a hazardous material is present and the contaminant level is unknown. Testing must be performed before entering if there is a possibility that the area contains an unknown toxic, oxygen deficient or other hazardous atmosphere. Areas of particular concern are:

1. A build up of welding fumes
2. Painting operations
3. Areas containing suspicious or unknown atmospheres

### **Entry Procedures and Use of Respirators**

Employees must wear proper respiratory protection when entering any area suspected of containing a hazardous atmosphere of an unknown concentration until the area has been tested and verified to be safe for non-respirator entry. Employees who are exposed to toxic levels of atmospheric hazards in the work environment must wear approved respirators, of the correct type, which have the appropriate filter cartridges for the particular task. Assigned respirators must be properly fitted.

### **Selection of Respirators**

Only NIOSH/MSHA approved respirators may be used. The choice between respirator types and cartridge types is dependent upon the airborne contaminant present, the hazardous operation performed, and the comfort and ease of obtaining a proper individual fit.

The useful life of respirators and cartridges will vary depending on the job duties and the actual time in use. As a general rule, dust cartridges should be changed when filter resistance makes breathing difficult, while chemical cartridges should be changed when an odor or taste can be detected.

### **Respirator Limitations**

Each respirator will have some limitations. Refer to the respirator instructions and WAC 296-62-07113 (Table #4) for respirator limitations. Air purifying respirators must only be used in at least 19.5% oxygen atmospheres (oxygen content of outside air is about 21%).

### **Respirator Efficiency Factor**

A respirator protection factor is a measure of the degree of protection provided by a respirator to a respirator wearer. Multiplying the permissible time-weighted average concentration for a toxic substance by the protection factor assigned to a respirator gives the maximum concentration of the hazardous substance for which the respirator can be used. Limitations of filters and cartridges must be taken into account when determining the protection factor.

Workers are not permitted to perform tasks requiring respiratory protection if the above expressed limits are exceeded. Quantitative and qualitative testing of the work area must be performed to verify toxicity levels.

### **Unanticipated Spills**

An unanticipated spill of a large quantity of any highly toxic chemical could produce a toxic and oxygen deficient atmosphere described above. In such a case the building must be immediately evacuated and emergency rescue Fire Department personnel called in to assist.

### **Training of Employees**

Employees will be trained in the use and maintenance of respirators before being assigned one. The minimum training for respirator wearers shall consist of the following elements:

1. The reasons for the need of respiratory protection
2. The nature, extent, and effects of respiratory hazards to which the person may be exposed
3. An explanation of why engineering controls are not being applied or are not adequate and what effort is being made to reduce or eliminate the need for respirators
4. An explanation of why a particular type of respirator has been selected for a specific respiratory hazard
5. An explanation of the operation, and the capabilities and limitations, of the respirator selected
6. Instruction in inspecting, donning, checking the fit of, and wearing the respirator
7. An opportunity for each respirator wearer to handle the respirator, learn how to don and wear it properly, check its seals, wear it in a safe atmosphere, and wear it in a test atmosphere
8. An explanation of how maintenance and storage of the respirator is carried out
9. Instructions in how to recognize and cope with emergency situations
10. Instructions as needed for special respirator use
11. Regulations concerning respirator use that will include wearing instructions, training and practice demonstrations covering:

- A. Donning, wearing, and removing the respirator
- B. Adjusting the respirator so that its respiratory-inlet covering is properly fitted on the wearer, causing a minimum of discomfort to the wearer
- C. Allowing the respirator wearer an opportunity to wear the respirator in a test atmosphere to demonstrate that the respirator provides protection the wearer. A test atmosphere is any atmosphere in which the wearer can carry out activities simulating work movements and respirator leakage or respirator malfunction can be detected by the wearer.

### **Records and Documentation of Training**

A record will be kept in each department of those employees who have been trained. Employees must understand and be able to apply the information in this respirator program including the daily use, care, and safekeeping of respirators.

### **Supervisor Training**

Supervisors, who have the responsibility of overseeing the work activities of one or more persons who must wear respirators, will train them in the proper use of respirators.

#### **Retraining**

Each respirator wearer shall be retrained as necessary to assure effective respirator use. Refresher training shall be given at least annually.

#### **Fitting of Respirators**

Proper fitting of negative pressure respirators is essential if employees are to receive the protection for which this program is designed. Air that passes around the face piece of the respirator, rather than through it, is not filtered air. In order to ensure a good face seal, the manufacturer's fitting instructions and the rules below must be followed:

#### **Respirator Sealing Problems**

Respirators may not be worn when conditions prevent a seal of the respirator to the wearer.

1. A person who has hair (stubble, mustache, sideburns, beard, low hairline, bangs) which passes between the face and the sealing surface of the face piece of the respirator is not permitted to wear such a respirator.
2. A person who has hair (mustache, beard) which interferes with the function of a respirator valve is not permitted to wear the respirator.
3. The wearing of a spectacle with temple bars or straps, a head covering, a goggle, a face shield, a welding helmet, or other device which interferes with the seal of a respirator to the wearer may not be used.

4. If scars, hollow temples, excessively protruding cheekbones, or any other condition or facial configuration prevent a seal of a respirator face piece to a wearer's face, then the person may not wear a respirator.

### **Fit Test**

The following pressure fit check should be performed every time a respirator is worn:

1. Cover air inlets with palms of hands.
2. Gently breathe in so that face piece collapses slightly.
3. Hold breath for 10 seconds.
4. If the respirator remains slightly collapsed and no inward leaks are felt, the face piece probably fits tightly enough.
5. Cover air outlet.
6. Exhale gently.
7. A small build-up of positive pressure, but no outward leaks, usually indicates a good face piece fit.

### **First Time Fit Test**

A more elaborate fit test will be conducted on each new employee or new type of respirator used. The respirator must be tested using the appropriate qualitative fit test (contact the safety officer for fit test information).

Negative pressure respirators for asbestos use must be tested every six months according to Appendix C of the OSHA/WISHA asbestos code.

### **Annual Retesting**

Annual retesting of respirators will be conducted to verify the condition of respirators and quality of seal. Defective equipment or parts will be replaced.

### **Maintenance of Respirators**

Respirators should be cleaned after each day's use and placed in a plastic bag or stored in another container provided for this purpose (zip-lock bags or clean coffee can). Do not leave them in the work area or hung on a nail.

About once each week (or more often, if needed) respirators should be completely cleaned and disinfected by carrying out the following procedures:

### **Cartridges**

Remove the cartridge from the respirator body. Cartridges must never be washed or disinfected.

**Body**

Immerse the respirator body in a warm soap and water solution. The respirator face piece and parts may be scrubbed gently with a cloth or soft brush. Make sure that all foreign matter is removed from all surfaces of the rubber exhalation valve flap and plastic exhalation valve seats.

Step 1: Disinfect with a commercial solution, alcohol wipes; or two tablespoons of bleach or one teaspoon of tincture of Iodine per gallon of water.

Step 2: After washing and disinfecting the respirator, rinse it with warm water and then allow the respirator to air dry. Do not store the respirator with wet straps. Mildew will result. The face piece, inhalation and exhalation valves must be in a normal position during storage to prevent the abnormal "set" of elastomer parts.

Step 3: After the respirator is dry, reattach the cartridges.

Any malfunction on the respirator shall be reported to your supervisor who will supply replacement parts.

**Inspections**

Each person assigned to use a respirator must maintain and routinely inspect it before and after each use. Respirators will be inspected monthly to assure that they are clean and in satisfactory working condition. The respirator inspection will include:

1. Tightness of connections.
2. Conditions of face piece.
3. Conditions of head bands.
4. Condition of cartridges.
5. Condition of valves.
6. Rubber or elastomers for pliability.
7. Rubber or elastomer for deterioration.

NOTE: Stretching and manipulating rubber or elastomer parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage. Worn out parts should be replaced promptly.

## Forklift Operating Procedures (Powered Industrial Trucks)

### Operator Training

Only trained and authorized operators shall be permitted to operate a forklift. Operators will receive periodic training or review in the safe operation of forklifts. See the supervisor for details.

### Forklift Operation Guidelines

1. Forklifts shall not be driven up to anyone standing in front of a bench or other fixed object.
2. No person is permitted to stand or pass under the elevated portion of any forklift, whether loaded or empty.
3. Unauthorized personnel are not permitted to ride on forklifts. An authorized rider may only ride if a safe place to ride is established.
4. It is prohibited to place arms or legs between the uprights of the mast or outside the running lines of the forklift.
5. When leaving a forklift unattended, fully lower load engaging means, neutralize controls, shut off power, and set brakes. Wheels must be blocked if the truck is parked on an incline. *A forklift is considered unattended when: (1) the operator is 25 feet or more away from the vehicle if it remains in view, or (2) the operator leaves the vehicle and it is not in view.*
6. When the operator of a forklift is dismounted and within 25 feet of the truck, still in view, the load engaging means must be fully lowered, controls neutralized, and the brakes set to prevent movement.
7. The forklift must be driven backwards if the load obstructs the drivers view.
8. When approaching a blind corner, an aisle, an area of pedestrian traffic, pedestrians in the area or similar situations, the driver must sound the horn as a courtesy or warning.
9. Respecting the safety of other workers is the constant job and responsibility of the operator. Therefore maintaining a safe speed at all times is an absolute necessity.
10. The forklift must not be driven with the load in a raised position. When approaching or leaving a loading area the load must be kept in the proper traveling position, close to the ground.
11. Pallets placed onto shelving must be firmly supported by the two rails. Shelving members and supports should be check regularly for strength and stability. The load must not exceed the safe maximum storage capacity of the shelving.
12. A safe distance must be maintained from the **edge of ramps** or platforms while on any elevated dock, or platform or freight car. Forklifts may not be used for opening or closing

freight car doors unless the forklift is using an approved device specifically designed to open and close doors.

13. **Brakes must be set and wheel blocks** in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Although it is the responsibility of the driver of the truck, trailer ...etc. to set the brakes and chock (block) the wheels, it is the responsibility of the forklift operator to verify that the vehicle has been properly secured from movement before driving onto the vehicle to load or unload it.

Fixed jacks may be necessary to support a semi-trailer during loading or unloading when the trailer is not coupled to a tractor. The flooring of trucks, trailers, and railroad cars must be checked for breaks and weakness before they are driven onto.

14. There must be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
15. An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.
16. A load backrest extension must be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.
17. Only approved industrial trucks (forklifts) shall be used in hazardous locations.
18. Whenever a forklift is equipped with vertical only, or vertical and horizontal controls and able to be elevated with the lifting carriage or forks for lifting personnel, the following additional precautions must be taken for the protection of personnel being elevated.
  - A. Use of a safety platform firmly secured to the lifting carriage and/or forks.
  - B. Means shall be provided whereby personnel on the platform can shut off power to the forklift.
  - C. Such protection from falling objects as indicated necessary by the operating conditions must be provided.
19. Using forklifts as **elevated work platforms**. A platform or structure built specifically for hoisting persons may be used providing the following requirements are complied with:
  - A. The structure must be securely attached to the forks and must have standard guardrails and toe boards installed on all sides.
  - B. The hydraulic system must be so designed that the lift mechanism will not drop faster than 135 feet per minute in the event of a failure in any part of the system. Forklifts used for elevating work platforms must be identified that they are so designed.

- C. A safety strap must be installed or the control lever must be locked to prevent the boom from tilting.
  - D. An operator must attend the lift equipment while workers are on the platform.
  - E. The operator must be in the normal operating position while raising or lowering the platform.
  - F. The vehicle must not travel from point to point while workers are on the platform except that inching or maneuvering at very slow speed is permissible.
  - G. The area between workers on the platform and the mast must be adequately guarded to prevent contact with chains or other shear points.
20. Fire aisles, access to stairways, and fire equipment must be kept clear.

#### **Operation of the Forklift**

1. If at any time a forklift is found to be in need of repair, defective, or in any way unsafe, the forklift must be taken out of service until it has been restored to safe operating condition.
2. Fuel tanks may not be filled while the engine is running. Spillage must be avoided.
3. Spillage of oil or fuel must be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.
4. No forklift will be operated with a leak in the fuel system until the leak has been corrected.
5. Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

#### **Lighting for Operating Areas**

1. Controlled lighting of adequate intensity should be provided in operating areas.
2. Where general lighting is less than 2 lumens per square foot, auxiliary directional lighting must be provided on the truck.

#### **Control of Noxious Gases and Fumes**

1. Concentration levels of carbon monoxide gas created by forklift operations must not exceed the levels specified in WAC 296-62-075.
2. Questions concerning degree of concentration and methods of sampling to ascertain the conditions will be referred to a qualified industrial hygienist.
3. Fixed jacks may be necessary to support a semi-trailer and prevent up-ending during the loading or unloading when the trailer is not coupled to a tractor.

## **Operating Campus Vehicles**

### **Introduction**

Campus vehicles must be operated in strict accordance with state and city laws. No work or errand is of sufficient importance to warrant violations of safe driving practices. No employee is permitted to jump from a vehicle, truck bed...etc. to the ground.

Employees driving campus vehicles must be qualified, have a valid Washington State driver's license in their possession and have permission to drive or operate a campus vehicle. An employee must never drive or operate a campus vehicle while restricted from such duty by order of a doctor.

### **Vehicle Condition**

An employee assigned as driver of a campus vehicle is responsible for all matters pertaining to the safe operation of the vehicle. Defects or repairs must be promptly reported. Vehicle cabs must be kept clean and free of loose tools, etc. The windshield must be kept clean for good visibility.

The driver must make certain that emergency equipment required by state law is on the vehicle and in good condition. Brakes, steering, horn, lights, and controls must be inspected and tested to insure that they are in good repair and safe operating condition before the vehicle is used.

All motor vehicle trucks and trailers must be equipped with standard lights, horn flags, flares, etc., to conform to the State of Washington motor vehicles laws.

Tires worn beyond the point of safety must not be used. Precautions must be taken while inflating tires.

### **Brakes**

Motor vehicle trucks must be equipped with brakes which will safely hold the maximum load on maximum grades. Trailers must be equipped with good, workable air brakes, or other type of brake equipment approved by the state commission on equipment. Air must be cut into the trailer brake system at the time that the trailer is coupled to the truck. Brakes on trucks and trailers must be tested at the start of each day and before equipment descends a steep grade.

### **Vehicle Loads and Loading**

All loads transported on trucks and/or trucks and trailers must be properly secured and distributed, and limited to a safe operating load for driving conditions.

Safe methods of loading and unloading motor vehicle trucks and trailers must be observed at all times. The truck driver is responsible for setting the brakes and chocking the wheels whenever a forklift is driven onto the vehicle for loading and unloading purposes.

Drivers must observe laws and regulations regarding legal width, height, length, and axle loads of the vehicle being operated.

Loads must be properly distributed and not piled too high. Loading must be such that the driver has clear vision to the front, sides and rear. When necessary, they must be blocked, tied, or padded to prevent shifting or damage.

If it is necessary to unload from the street side extra care and precautions should be used. Whenever possible, work should be done from the curb side.

### **Vehicle Operation**

Campus vehicles are a constant statement about Yakima Valley Community College and should be driven in a manner so as to create a favorable impression on the public. Show more than ordinary courtesy and consideration for other drivers and pedestrians.

Truck drivers must operate equipment at a safe speed for roadway conditions.

Secure all doors, end gate enclosures, and equipment before driving. Before starting either forward or backward, check that no person or object is in the path of the vehicle.

### **Pedestrians**

Always give the pedestrian the right of way. Do not sound the horn to warn a pedestrian unless it is necessary.

### **Parking**

Trucks parked on an incline must have the steered wheels turned into the curb and must have at least one "driver" wheel chocked on each side, independent of the braking system.

### **Private Property**

Driving on private property such as driveways, parking lots and other standard vehicle areas is permitted. In the case of lawn areas...etc., drive with special care taking into account the weight of the vehicle and damage that might result. Extra courtesy must also be used in these instances.

### **Seat Belts**

When driving or riding in a campus vehicle, seat belts must be worn in accordance with state regulations the seat belt must be adjusted so that it is snug enough to afford the maximum protection without being uncomfortable. Fasten the seat belt before moving the vehicle. Do not attempt to fasten the seat belt while the vehicle is moving.

When maneuvering a vehicle into a position that requires backing into a location at a job site or dock area, the seat belt may be unfastened temporarily while such maneuvering is in progress.

### **Backing the Vehicle**

To prevent accidents during the backing of trucks where vision is obstructed, a signal man will be stationed at a point giving him a clear view of the rear of the truck and the operator of the truck at all times. Truck drivers must sound their horn before starting to back, and must sound the horn intermittently during the entire backing operation.

**Waste Materials**

Drivers or passengers must not throw objects from the vehicle. All materials being transported must also be secured to prevent material from being blown off the vehicle.

**Children**

Drivers must drive with extra care when passing school grounds, playgrounds, or when driving in the vicinity of children.

**Right of Way**

Drivers must drive courteously at all times and should yield the right-of-way to other vehicles or pedestrians whenever there is a question as to who has the right-of-way.

**U-turns**

Drivers must plan routes to avoid U-turns as far as possible. When such turns cannot be avoided, appropriate signaling requirements must be observed. Drivers must comply with all state and city requirements governing U-turns.

**Parking**

Drivers must comply with state and city parking regulations except when exemption is granted for work involving construction, operations, entrance or egress. Vehicles parked under special conditions must be protected by specified warning devices.

At any time a campus vehicle is parked, it is the driver's responsibility to make certain that:

1. Wheels are turned into the curb.
2. Vehicle is taken out of gear and put in park position in those vehicles having automatic transmission. Whenever possible, vehicles with standard transmission will be left in gear.
3. Parking brake is set.

**Stopping For School Buses**

Drivers must comply with Vehicle Code requirements covering stopping for school buses.

**Stopping At Railroad Grade Crossings**

The Motor Vehicle Code requires stopping at railroad grade crossings when operating a motor truck that has employees as passengers whenever they are outside of the cab.

**Overtaking and Passing**

Drivers may overtake and pass vehicles only when the roadway is clearly visible and free of traffic for sufficient distance ahead to permit safely overtaking and passing, provided that such passing is not prohibited by highway signs or markings.

**Speed Laws**

Drivers of vehicles must comply with the following Vehicle Code requirements governing speed regulations:

Basic Speed Law requires a speed that is safe for all conditions including traffic, surface and width of roadway, weather conditions, visibility, etc.

Observe Speed Limits established by Code for certain situations such as blind crossings, business and residential districts, and other special zones established by the posting of speed limit signs as well as Special Speed Restrictions as established to cover various types of vehicles, trailers or combinations.

### **Vehicle Safety Equipment**

Each vehicle must have a first-aid kit and fire extinguisher in the cab. The first-aid kit must be fully stocked and the fire extinguisher fully charged. Extinguishers must be inspected annually or sooner to comply with federal law or other regulation.

Safety equipment, such as cones and warning signs that are assigned to a vehicle will be regarded as standard equipment on that vehicle. The driver of the vehicle will be responsible for their use and availability.

## **Welding Procedures**

### **Gas Welding and Cutting**

#### **Handling Compressed Gas Cylinders**

The following procedures should be followed when handling gas cylinders:

1. Valve protection caps must be in place and secured.
2. Cylinders will be moved by tilting and rolling them on their bottom edges. They must not be intentionally dropped, struck, or permitted to strike each other violently.
3. Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators must be removed and valve protection caps put in place before cylinders are moved.
4. A suitable cylinder truck, chain, or other steadying device must be used to keep cylinders from being knocked over while in use. Such cylinders are not considered to be "in storage." In storage, cylinders should be secured.

#### **Placing Cylinders**

1. Cylinders must be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields must be provided.
2. Cylinders must be placed where they cannot become part of an electrical circuit. Electrodes must not be struck against a cylinder to strike an arc.
3. Fuel gas cylinders must be placed with valve end up whenever they are in use. They must not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

## Use of Fuel Gas

Employees should understand and follow these safety procedures developed by the State of Washington.

1. Before a regulator to a cylinder valve is connected, the valve must be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve must stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder must not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition.
2. The cylinder valve must always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders must not be opened more than 1 1/2 turns. When a special wrench is required, it must be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. Nothing must be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.
3. Fuel gas must not be used without reducing the pressure through a suitable regulator attached to the cylinder valve.
4. Before a regulator is removed from a cylinder valve, the cylinder valve must always be closed and the gas released from the regulator.
5. If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve must be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder must be discontinued, and it must be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder must be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.
6. If a leak should develop at a fuse plug or other safety device, the cylinder must be removed from the work area.
7. Cylinders not having fixed hand wheels must have keys, handles, or non adjustable wrenches on valve stems while in service.
8. Torches in use must be inspected before use for leaking shutoff valves, hose couplings, and tip connections. Defective torches may not be used.
9. Torches must be lighted by friction lighters or other approved devices, and not by matches or from hot work.

**Regulators and Gauges**

Oxygen and fuel gas pressure regulators, including their related gauges, must be in proper working order while in use.

**Oil and Grease Hazards**

Oxygen cylinders and fittings must be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus must be kept free from oil or greasy substances and must not be handled with oily hands or gloves. Oxygen must never be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

**Hoses**

Fuel gas hose and oxygen hose must be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses must not be interchangeable. A single hose having more than one gas passage must not be used.

When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches must be covered by tape.

All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, must be inspected at the beginning of each working shift. Defective hose must be removed from service.

Hose which has been subject to flashback, or which shows evidence of severe wear or damage, must be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, must not be used.

Hose couplings must be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

Boxes used for the storage of gas hose must be ventilated.

Hoses, cables, and other equipment must be kept clear of passageways, ladders and stairs.

**Torches**

Clogged torch tip openings must be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

Torches in use must be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches must not be used.

Torches must be lighted by friction lighters or other approved devices, and not by matches or from hot work.

## **Arc Welding and Cutting**

### **Manual electrode holders.**

Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, may be used.

Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, must be fully insulated against the maximum voltage encountered to ground.

### **Welding Cables and Connectors**

Cables in need of repair may not be used. When a cable, other than the cable lead becomes worn to the extent of exposing bare conductors, the portion thus exposed must be protected by means of rubber and friction tape or other equivalent insulation.

### **Operating instructions**

Employees must follow these safe means of arc welding and cutting:

1. When electrode holders are to be left unattended, the electrodes must be removed and the holders placed or protected so that they cannot make electrical contact with employees or conducting objects.
2. Hot electrode holders may not be dipped in water; to do so may expose the arc welder or cutter to electric shock.
3. The power supply switch to the equipment must be turned off whenever the welder has to leave his work or stop for any appreciable length of time, or whenever the arc welding or cutting equipment needs to be moved.
4. Any faulty or defective equipment must be reported to the shop supervisor.

### **Shielding**

Whenever practical, all arc welding and cutting operations must be shielded by noncombustible or flameproof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

### **Protective Clothing**

**General Requirements.** Employees exposed to the hazards created by welding, cutting, or brazing operations will use proper personal protective equipment. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed. The following specified protective clothing may be employed:

**Eye Protection.** Eye protection sufficient to protect the worker from harmful radiation must be used. Employees in the area not protected from the arc by screening must be protected by filter lenses meeting the standard requirements. When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type must be worn under welding helmets. Hand

shields to protect the welder against flashes and radiant energy should be used when either the helmet is lifted or the shield is removed.

**Gloves.** Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

**Aprons.** Flameproof aprons made of leather, or other suitable material may also be desirable as protection against radiated heat and sparks.

**Clothing.** Woolen clothing preferable to cotton because it is not so readily ignited and helps protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls must be reasonably free from oil or grease.

**Sleeves & Collars.** Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside.

*Note: For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.*

**Jackets & Caps.** Jackets or shoulder covers made of leather or other suitable materials must be worn during overhead welding or cutting operations. Leather skull caps should be worn under helmets to prevent head burns.

### **Eye and Face Protective Wear**

Employees must use eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.

Eye and face protection equipment required by this part should meet the requirements specified in American National Standards Institute, Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection.

Employees whose vision requires the use of corrective lenses in spectacles, when required by this regulation to wear eye protection, must be protected by goggles or spectacles of one of the following types:

1. Spectacles whose protective lenses provide optical correction;
2. Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.
3. Goggles that incorporate corrective lenses mounted behind the protective lenses.

Face and eye protection equipment must be kept clean and in good repair. The use of this type equipment with structural or optical defects is prohibited.

The table in the Appendix at the end of this chapter should be used as a guide in the selection of face and eye protection for the hazards and operations noted.

### **Fire Prevention**

1. When practical, objects to be welded, cut, or heated must be moved to a designated safe location or, if the objects to be welded, cut, or heated cannot be readily moved, all movable fire hazards in the vicinity must be taken to a safe place, or otherwise protected.
2. If the object to be welded, cut, or heated cannot be moved and if all the fire hazards cannot be removed, positive means must be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.
3. No welding, cutting, or heating is permitted where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.
4. Suitable fire extinguishing equipment must be immediately available in the work area and must be maintained in a state of readiness for instant use.
5. When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel must be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists. Such personnel will be instructed as to the specific anticipated fire hazards and how the fire fighting equipment provided is to be used.
6. When welding, cutting, or heating is performed on equipment bodies, cowlings or casings, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent area, the same precautions must be taken on the opposite side as are taken on the side on which the welding is being performed.
7. All drums, pails, and other containers, which contain or have contained flammable liquids, must be kept closed (except when removing or transferring the contents). Empty containers are to be removed to a safe area apart from hot work operations or open flames.
8. Before welding, cutting, or heating is begun, all drums, containers, or hollow structures which have contained toxic or flammable substances must either be filled with water or thoroughly cleaned of such substances and ventilated and tested. When welding, cutting and heating on steel pipelines containing natural gas, the pertinent portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines, must be followed.
9. Before heat is applied, a vent opening must be provided for the release of any built-up pressure caused by the applying of heat to any drum, container, or hollow structure.

### **Ventilation And Protection In Welding, Cutting, And Heating.**

General welding, cutting, and heating not involving toxic conditions or materials described in the following sections, may normally be done without mechanical ventilation or respiratory

protective equipment. Suitable mechanical ventilation or respiratory protective equipment must be used when unusual physical or atmospheric conditions create an unsafe accumulation of contaminants.

#### **Mechanical Ventilation.**

For purposes of this section, mechanical ventilation must meet the following requirements:

1. Mechanical ventilation consists of either general mechanical ventilation systems or local exhaust systems.
2. General mechanical ventilation must be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.
3. Local exhaust ventilation must consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work, that is of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits.
4. Contaminated air exhausted from a working space must be discharged into the open air or otherwise clear of the source of intake air.
5. Oxygen must never be used for ventilation purposes, comfort cooling, blowing dust from clothing, or for cleaning the work area.

#### **Welding, Cutting, or Heating Toxic Metals**

Welding, cutting, or heating in any enclosed spaces involving the metals specified below must be performed with either general mechanical or local exhaust ventilation:

1. Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.
2. Lead base metals;
3. Cadmium-bearing filler materials;
4. Chromium-bearing metals or metals coated with chromium-bearing materials.
5. Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials;
6. Cadmium-bearing or cadmium-coated base metals;
7. Metals coated with mercury-bearing metals;
8. Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium must be done with both local exhaust ventilation and air line respirators.

Employees performing such operations in the open air will be protected by approved filter-type respirators. Employees performing such operations on beryllium-containing base or filler metals will be protected by approved air line respirators.

#### **Other Employees**

Other employees exposed to the same atmosphere as the welders or burners must be protected in the same manner as the welder or burner.

## **Welding or Cutting Containers**

**Used containers.** No welding, cutting, or other hot work may be performed on used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel must be disconnected or blanked.

**Venting and purging.** All hollow spaces, cavities or containers must be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

### **Cleaning Compounds**

**Manufacturer's instructions.** In the use of cleaning materials, because of their possible toxicity of flammability, appropriate precautions such as manufacturer's instructions must be followed.

**Degreasing.** Degreasing or other cleaning operations involving chlorinated hydrocarbons will be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation. In addition, trichloroethylene and perchloroethylene should be kept out of atmospheres penetrated by the ultraviolet radiation of gas-shielded welding operations.

## **Grounds – Power Movers**

### **Definition of Terms**

**Blade tip circle.** The path described by the outermost point of the blade as it is rotated about its shaft axis.

**Guards.** A part or an assembly provided for shielding a hazardous area of a machine.

**Catcher assemblies.** Parts or combinations of parts which provide a means for collecting grass clippings or debris.

**Walk-behind mower.** A mower either pushed or self-propelled and normally guided by the operator walking behind the unit.

**Operator area, walk-behind mowers.** For discharge interference purposes, that area confined within a circle no smaller than 30 inches in diameter, the center of which is located to the rear of the mower on its longitudinal centerline 30 inches behind the nearest blade tip circle.

**Power reel mower.** A lawn-cutting machine utilizing a power source to rotate one or more helically formed blades about a horizontal axis to provide a shearing action with a stationary cutter bar or bed knife.

**Power rotary mower.** A lawn-cutting machine utilizing a power source to rotate one or more cutting blades about a vertical axis.

**Lowest blade position.** The lowest blade position under static conditions.

**Riding mower.** A powered, self-propelled lawn-cutting vehicle on which the operator rides and controls the machine.

**Sulky type mower.** Normally, a walk-behind mower which has been converted to a riding mower by the addition of a sulky.

**Deadman control.** A control designed so that it will automatically interrupt power to a drive when the operator's actuating force is removed.

### **General Requirements**

1. Proper hearing protection and eye protection must be worn where there is a hazard from either excessive noise (above 85 DbA) or from projected objects.
2. Power lawnmowers of the walk-behind, riding-rotary types, and reel power lawnmowers designed for use by employees must meet the design specifications in "American National Standard Safety Specifications for Power Lawnmowers" ANSI B71.1-1968. These specifications do not apply to sulky-type mowers, flail mowers, sickle-bar mowers, or mowers designed for commercial use.
3. All power-driven chains, belts, and gears must be so positioned or otherwise guarded to prevent the operator's accidental contact, during normal starting, mounting, and operation of the machine.
4. A shutoff device must be provided to stop operation of the motor or engine. This device must require manual and intentional reactivation to restart the motor or engine.
5. All positions of the operating controls must be clearly identified.
6. The words, "Caution. Be sure the operating control(s) is in neutral before starting the engine," or similar wording must be clearly visible at an engine starting control point on self-propelled mowers.

### **Walk-Behind And Riding Rotary Mowers**

1. The mower blade must be enclosed except on the bottom and the enclosure must extend to or below the lowest cutting point of the blade in the lowest blade position.
2. Guards which must be removed to install a catcher assembly must comply with the following:
  - A. Warning instructions must be affixed to the mower near the opening stating that the mower must not be used without either the catcher assembly or the guard in place.

- B. The catcher assembly or the guard must be installed on newly purchased mowers before they are put into use.
  - C. The instruction manual must state that the mower must not be used without either the catcher assembly or the guard in place.
  - D. The catcher assembly, when properly and completely installed, must not create a condition which violates the limits given for the guarded opening.
3. Openings in the blade enclosure must meet WAC 296-24-66505(3) safety standards.
  4. The word "caution" or stronger wording, must be placed on the mower at or near each discharge opening.
  5. Blade(s) must stop rotating from the manufacturer's specified maximum speed within 15 seconds after declutching, or shutting off power.
  6. In a multi-piece blade, the means of fastening the cutting members to the body of the blade or disc must be so designed that they will not become worn to a hazardous condition before the cutting members themselves are worn beyond use.
  7. The maximum tip speed of any blade must be 19,000 feet per minute.

#### **Walk-Behind Rotary Mowers**

1. The horizontal angle of the opening(s) in the blade enclosure, intended for the discharge of grass, must not contact the operator area.
2. There must be one of the following at all openings in the blade enclosure intended for the discharge of grass:
  - A. A minimum unobstructed horizontal distance of 3 inches from the end of the discharge chute to the blade tip circle.
  - B. A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.
3. The highest point(s) on the front of the blade enclosure, except discharge openings, must be such that any line extending a maximum of 15\_ downward from the horizontal toward the blade shaft axis (axes) must not intersect the horizontal plane within the blade tip circle. The highest point(s) on the blade enclosure front, except discharge-openings, must not exceed 1 and 1/4 inches above the lowest cutting point of the blade in the lowest blade position. Mowers with a swing-over handle are to be considered as having no front in the blade enclosure and therefore must comply with WAC 296-24-66505(1).
4. The mower handle must be fastened to the mower so as to prevent loss of control by unintentional uncoupling while in operation.

5. A positive upstop or latch must be provided for the mower handle in the normal operating position(s). The upstop must not be subject to unintentional disengagement during normal operation of the mower. The upstop or latch must not allow the center or the handle grips to come closer than 17 inches horizontally behind the closest path of the mower blade(s) unless manually disengaged.
6. A swing-over handle, which complies with the above requirements, is permitted.
7. Wheel drive disengaging controls, except deadman controls, must move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls must comply with WAC 296-24-66501(11) and may operate in any direction to disengage the drive.

### **Riding Rotary Mowers**

1. The highest point(s) of all openings in the blade enclosure, front must be limited by a vertical angle of opening of 15° and a maximum distance of 1 1/4 inches above the lowest cutting point of the blade in the lowest blade position.
2. Opening(s) must be placed so that grass or debris will not discharge directly toward any part of an operator seated in a normal operator position.
3. There must be one of the following at all openings in the blade enclosure intended for the discharge of grass:
  - A. A minimum unobstructed horizontal distance of six inches from the end of the discharge chute to the blade tip circle.
  - B. A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.
  - C. Mowers must be provided with stops to prevent jackknifing or locking of the steering mechanism.
4. Vehicle stopping means must be provided.
5. Hand-operated wheel drive disengaging controls must move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls must be depressed to disengage the drive. Deadman controls, both hand and foot operated, must comply with WAC 296-24-66501(11) and may operate in any direction to disengage the drive.

## Fall Protection

### Fall Protection Introduction

If anyone is exposed to a fall hazard of 10 feet or more in height, the employee must protect themselves by using a proper fall restraint or fall arrest system or positioning device system as described below.

### Fall Protection Work Plan

A fall protection work plan must be filled out for each job site where fall hazards of 10 feet or more exist. Any items that apply should be filled in on the fall protection work plan form.

Employees who have been assigned to work in areas where fall hazards exist must:

1. Be knowledgeable in the fall protection equipment and procedures which apply.
2. Inspect fall protection devices and systems before use.

### Fall Restraint (restrained from falling)

Fall restraint protection consists of any of the following:

1. A standard guardrail.
2. A safety belt and/or harness attached to securely rigged restraint lines.
  - A. Safety belts and/or harness must conform to ANSI standard:
    1. Class I body belt.
    2. Class II chest harness.
    3. Class III full body harness.
    4. Class IV suspension/position belt.
  - B. All safety belt and lanyard hardware assemblies must be capable of withstanding a tensile loading of 4,000 pounds without cracking, breaking, or taking a permanent deformation.
  - C. Rope grab devices are prohibited for fall restraint applications unless they are part of a fall restraint system designed specifically for the purpose by the manufacturer, and used in strict accordance with the manufacturer's recommendations and instructions.
  - D. All components must be compatible.
  - E. Components of fall restraint systems must be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components should be removed from service if their function or strength have been adversely affected.
  - F. Anchorage points used for fall restraint must be compatible of supporting four times the intended load.

- G. Restraint protection must be rigged to allow the movement of employees only as far as the sides and edges of the walking/working surface.
3. A warning line system together with a safety monitor system to protect workers engaged in duties between the forward edge of the warning line and the unprotected sides and edges, including the leading edge, of a low-pitched roof or walking/working surface.
4. Warning line and safety monitor systems are not allowed on surfaces exceeding a 4 in 12 pitch, and on any surface whose dimensions are less than 45 inches in all directions.

### **Fall Arrest Protection**

Fall arrest protection consists of the following:

#### **A Full Body Harness System**

An approved Class III full body harness must be used.

Systems or components that have been subjected to impact loading must be immediately removed from service and not used again unless inspected and determined by a competent person to be undamaged and suitable for reuse.

All safety lines and lanyards should be protected against being cut or abraded.

The attachment point of the body harness must be located in the center of the wearer's back near shoulder level, or above the wearer's head.

Body harness systems must be rigged to minimize free fall distance with a maximum free fall distance allowed of six feet, and such that the employee will not contact any lower level.

Hardware must be drop forged, pressed or formed steel, or made of materials equivalent in strength.

Hardware must have a corrosion resistant finish, and all surfaces and edges be smooth to prevent damage to the attached body harness or lanyard.

When vertical lifelines (droplines) are used, no more than one employee may be attached to any one lifeline.

Note: the system strength needs in the following items are based on a total combined weight of employee and tools of no more than 310 pounds. If combined weight is more than 310 pounds, appropriate allowances must be made or the system will not be deemed to be in compliance.

Full body harness systems must be secured to anchorages capable of supporting 5,000 pounds per employee except when self-retracting lifelines or other deceleration devices are used which limit free fall to two feet. Anchorages must be capable of withstanding 3,000 pounds.

Vertical lifelines (drop lines) must have maximum tensile strength of 5,000 pounds except that self-retracting lifelines and lanyards which automatically limit free fall distance to two feet or less must have a minimum tensile strength of 3,000 pounds.

Horizontal lifelines must have a tensile strength capable of supporting a fall impact load of at least 5,000 pounds per employee using the lifeline, applied anywhere along the lifeline.

Lanyards must have a minimum tensile strength of 5,000 pounds.

All components of body harness systems, unless otherwise specified, must be capable of supporting a minimal fall impact load of 5,000 pounds applied at the lanyard point of connection.

Snap hooks may not be connected to loops made in webbing type lanyards.

Snap hooks may not be connected to each other.

Not more than one snap hook may be connected to any one D ring unless they are the double locking type.

Full body harness systems must be inspected prior to each use for mildew, wear damage, and other deterioration and defective components removed from service if their function or strength have been adversely affected.

#### **Safety Nets.**

Safety net systems will not be used by Yakima Valley Community College.

#### **Catch Platform.**

If a catch platform is used:

1. A catch platform must be installed within 10 vertical feet of the work area.
2. The catch platforms width must be equal the distance of the fall but must be a minimum of 45 inches wide and must be equipped with standard guardrails on all open sides.

#### **Positioning Device Systems**

Positioning devices must be rigged so that an employee cannot free fall more than two feet.

Positioning devices must have anchorages capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.

Connectors must be drop forged, pressed or formed steel, or made of equivalent materials.

Connectors must have corrosion-resistant finish, and all surfaces and edges must be smooth to prevent damage to interfacing parts of the system.

Connecting assemblies must have a minimum tensile strength of 5,000 pounds.

D-rings and snap-hooks must be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking or taking permanent deformation.

Snap-hooks must be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap-hook by depression of the snap-hook keeper by the connected member, or must be a locking type snap-hook by the contact of the snap-hook keeper by the connected member. As of January 1, 1998, only locking type snap-hooks must be used.

Unless the snap-hook is a locking type and designed for the following connections, snap-hooks must not be engaged:

1. Directly to webbing, rope or wire rope.
2. To each other.
3. To a D-ring to which another snap-hook or other connector is attached.
4. To a horizontal lifeline; or
5. To any object which is incompatibly shaped or dimensioned in relation to the snap-hook such that unintentional disengagement could occur by the connected object being able to depress the snap-hook keeper and release itself.

Positioning device systems must be inspected prior to each use for wear, damage and other deterioration and defective components must be removed from service.

Body belts, harnesses and components must be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

### **Droplines or Lifelines**

If used in areas where the lifeline may be subjected to cutting or abrasion, it must be a minimum of 7/8 inch wire core manila rope. For all other lifeline applications, a minimum of 3/4 inch manila or equivalent, with a minimum breaking strength of 5,000 pound, should be used.

### **Guarding of Low-Pitched Roof Perimeters**

#### **General Provisions**

During the performance of work on low-pitched roofs with a potential fall hazard greater than 10 feet, all employees engaged in the work must use the proper protection as follows:

1. By the use of a fall restraint or fall arrest systems.
2. By the use of a proper warning line and safety monitoring combination system when they are working between the warning line and the roof edge.
3. Mechanical equipment can only be used and stored in areas where employees are protected by a warning line system, or fall restraint, or fall arrest systems. Mechanical equipment cannot be used or stored where the only protection is provided by a safety monitor.

### **Exceptions**

Fall restraint or fall arrest systems are not required at points of access such as stairways, ladders, and ramps, or when employees are on the roof only to inspect, investigate, or estimate roof level conditions.

Employees engaged in roofing on low-pitched roofs less than 50 feet wide, may elect to use a safety monitor system without warning lines.

### **Warning Line Systems**

Warning lines must be erected around all sides of the work area.

1. When mechanical equipment is not being used, the warning line must be erected not less than six feet from the edge of the roof.
2. When mechanical equipment is being used, the warning line must be erected not less than six feet from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

The warning line must consist of rope, wire, or chain, and supporting stanchions erected as follows:

1. The rope, wire, or chain must be flagged at not more than six foot intervals with high-visibility material.
2. The rope, wire, or chain must be rigged and supported in such a way that its lowest point (including sag) is no less than 36 inches from the roofs surface and its highest point is no more than 42 inches from the roof surface.
3. After being erected, with the rope, wire, or chain attached, stanchions must be capable of resisting, without topping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the roof surface, perpendicular to the warning line, and in the direction of the roof edge.
4. The rope, wire, or chain must have a minimum tensile strength of 200 pounds, and after being attached to the stanchions, must be capable of supporting, without breaking, the loads applied to the stanchions.
5. The line must be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

Access paths must be erected as follows:

1. Points of access, materials handling areas, and storage areas must be connected to the work area by a clear access path formed by two warning lines.

2. When the path to a point of access is not in use, a rope, wire, chain, equal in strength and height to the warning line, must be placed across the path at the point where the path intersects the warning line erected around the work area.

### **Roof Edge Materials Handling Areas and Materials Storage**

Employees working in a roof edge materials handling or materials storage area located on a low-pitched roof with a ground-to-eave height greater than 10 feet must be protected from falling along all unprotected roof sides and edges of the area.

1. When guardrails are used at hoisting areas, a minimum of four feet of guardrail must be erected on each side of the access point through which materials are hoisted.
2. A chain or gate must be placed across the opening between the guardrail sections when hoisting operations are not taking place.
3. When guardrails are used at bitumen pipe outlets, a minimum of four feet of guardrail must be erected on each side of the pipe.
4. When safety belt/harness systems are used, they must not be attached to the hoist.
5. When fall restraint systems are used, they must be rigged to allow the movement of employees only as far as the roof edge.
6. Materials must not be stored within six feet of the roof edge unless guardrails are erected at the roof edge.

### **Leading Edge Control Zone**

When performing leading edge work, the lead must ensure that a control zone be established according to the following requirements:

1. The control zone must begin a minimum of six feet back from the leading edge to prevent exposure by employees who are not protected by fall restraint or fall arrest systems.
2. The control zone must be separated from other areas of the low-pitched roof or walking/working surface by the erection of a warning line system.
3. The warning line system must consist of wire, rope, or chain supported on stanchions, or a method which provides equivalent protection.
4. The spacing of the stanchions and support of the line must be such that the lowest point of the line (including sag) is not less than 36 inches from the walking/working surface, and its highest point is not more than 42 inches from the walking/working surface.
5. Each line must have a minimum tensile strength of 200 pounds.

6. Each line must be flagged or clearly marked with high visibility materials at intervals not to exceed six feet.
7. After being erected with the wire, rope, or chain attached, stanchions must be capable of resisting without tipping over, a force of at least 16 pounds applied horizontally against the stanchions 30 inches above the roof surface, perpendicular to the warning line and in the direction of the roof edge.

When positive means of fall restraint, or fall arrest are not utilized, a safety monitor system must be implemented to protect employees working between the forward edge of the warning line and the leading edge.

### **Safety Monitor System**

A safety monitor system (SMS) may be used in conjunction with a warning line system as a method of guarding against falls during work on low-pitched roofs and leading edge work only.

When selected, the lead must ensure that the safety monitor system is addressed in the fall protection work plan, including the name of the safety monitor(s) and must ensure that the following requirements are met:

1. The safety monitor system may not be used when adverse weather conditions create additional hazards.
2. A person acting in the capacity of safety monitor(s) must be trained in the function of both the safety monitor and warning lines systems, and:
  - A. Be a competent person as defined above.
  - B. Have control authority over the work as it relates to fall protection.
  - C. Be instantly distinguishable over members of the work crew.
  - D. Engage in no other duties while acting as safety monitor.
  - E. Have a clear, unobstructed view and be able to maintain normal voice communication with the workers under their protection.
  - F. Supervise no more than eight exposed workers at one time.

Control zone workers must be distinguishable from other members of the crew by wearing highly visible, distinctive, and uniform apparel readily distinguishing them from other members of the crew only while in the control zone.

### **Roofing Brackets**

A roofing bracket is a bracket used in sloped roof construction, having provisions for fastening to the roof or supported by ropes fastened over the ridge and secured to some suitable object.

1. Roofing brackets will be constructed to fit the pitch of the roof.
2. Brackets shall be secured in place by nailing in addition to the pointed metal projections. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least three-quarter inch diameter, or equivalent.
3. A substantial catch platform shall be installed below the working area of roofs more than 20 feet from the ground to eaves with a slope greater than three inches in 12 inches without a parapet. In width the platform shall extend two feet beyond the projection of the eaves and shall be provided with safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.

## Definitions

**Anchorage** means a secure point of attachment for lifelines, lanyards or deceleration devices which is capable of withstanding the forces specified in the application sections of chapter 296-155 WAC.

**Approved** means, for the purpose of this section; tested and certified by the manufacturer, or any recognized national testing laboratory, to possess the strength requirements specified in this section.

**Body belt** means a Type 1 safety belt used in conjunction with lanyard or lifeline for fall restraint only.

**Full body harness** means a configuration of connected straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration devices.

**Full body harness system** means a Class III full body harness and lanyard which is attached to an anchorage meeting the requirements of chapter 296-155 WAC, Part C-1; or attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in the applicable sections of chapter 296-155 WAC.

**Catenary line** - see horizontal lifeline.

**Competent person** means an individual knowledgeable of fall protection equipment, including the manufacturer's recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing and potential fall hazards; and who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

**Connector** means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system (such as a

buckler or D-ring sewn into a body belt or body harness, or a snap-lock spliced or sewn to a lanyard or self-retracting lanyard).

**Continuous fall protection** means design and use of a fall protection system such that no exposure to an elevated fall hazard occurs. This may require more than one fall protection system or a combination of prevention or protection measures.

**Control zone** means the area between the warning line and the unprotected sides and edges of the walking/working surface.

**Deceleration device** means any mechanism, such as a rope grab, rip-stitch lanyard, specially woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate or substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

**Deceleration distance** means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

**Drop line** means a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard.

**Failure** means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

**Fall arrest system** means the use of multiple, approved safety equipment components such as: body harnesses, lanyards, deceleration devices, drop lines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged as to arrest a free fall. Compliance with anchorage strength requirements specified in the applicable sections of chapter 296-155 WAC, Part C-1 shall constitute approval of the anchorage.

**Fall protection work plan** means a written planning document in which the employer identifies all areas on the job site where a fall hazard of 10 feet or greater exists. The plan describes the method or methods of fall protection to be utilized to protect employees, and includes the procedures governing the installation, use, inspection, and removal of the fall protection method or methods which are selected by the employer (See WAC 296-155-24505).

**Fall-restraint system** means an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level. When standard guardrails are selected, compliance with applicable sections governing their construction and use shall constitute approval.

**Fall distance** means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

**Free fall** means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

**Free fall distance** means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard delongation, but includes any deceleration device slide distance and self-retracting lifeline/lanyard extension before the operate and fall arrest forces occur.

**Hardware** means snap hooks, D rings, bucklers, carabiners, adjusters, O rings, that are used to attach the components of a fall protection system together.

**Horizontal lifeline** means a vertical line from a fixed anchorage or between two horizontal anchorages and used for attachment of a worker's lanyard or lifeline device while moving horizontally; used to control dangerous pendulum-like swing falls.

**Lanyard** means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

**Leading edge** means the edge of a floor, roof, or form work for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or form work sections are placed, formed, or constructed. A leading edge is considered to be a non-protected side and edge during periods when it is not actively and continuously under construction.

**Lifeline** means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorage's at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall protection system to the anchorage.

**Locking snap hook** means a connecting snap hook that requires two separate forces to open the gate; one to deactivate the gatekeeper and a second to minimize roll out or accidental disengagement.

**Low-pitched roof** means a roof having a slope less than or equal to 4 in 12.

**Mechanical equipment** means all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mopcars.

**Positioning belt** means a single or multiple strap that can be secured around the worker's body to hold the user in a work position; for example, a lineman's belt, a rebar belt, or saddle belt.

**Positioning device system** means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

**Restraint line** means a line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to prevent the worker from falling to a lower level.

**Roll out** means unintentional disengagement of a snap hook caused by the gate being depressed under torque or contact while twisting or turning; a particular concern with single action snap hooks that do not have a locking gatekeeper.

**Roof** means the exterior surface on the top of a building. This does not include floors or form work which, because a building has not been completed, temporarily become the top surface of a building.

**Rope grab** means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

**Roofing work** means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

**Safety line** - see lifeline.

**Safety monitor system** means a system of fall restraint used in conjunction with a warning line system only, where a competent person as defined by this part, having no additional duties, monitors the proximity of workers to the fall hazard when working between the warning line and the unprotected sides and edges, including the leading edge of a low-pitched roof or walking/working surface.

**Self-retracting lifeline/lanyard** means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

**Shock absorbing lanyard** means a flexible line of webbing, cable, or rope used to secure a body belt or harness to a lifeline or anchorage point that has an integral shock absorber.

**Single-action snap hook** means a connecting snap hook that requires a single force to open the gate which automatically closes when released.

**Snap hook** means a self-closing connecting device with a gatekeeper latch or similar arrangement that will remain closed until manually opened. This includes single-action snap hooks that open when the gatekeeper is depressed and double-action snap hooks that require a second action on a gatekeeper before the gate can be opened.

**Static line** - see horizontal lifeline.

**Steep roof** means a roof having a slope greater than 4 in 12.

**Toeboard** means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

**Unprotected sides and edges** means any side or edge (except at entrances to points of access) of a floor, roof, ramp, or runway where there is no wall or guardrail system as defined in WAC 296-155-505(5)

**Walking/working surface** means for the purpose of this section, any area whose dimensions are 45 inches or greater in all directions, through which workers pass or conduct work.

**Warning line system** means a barrier erected on a walking and working surface or a low-pitch roof (4 in 12 or less), to warn employees that they are approaching an unprotected fall hazard(s).

**Work area** means that portion of a walking/working surface where job duties are being performed.