Applicable OSHA Standard: 29 CFR 1910 Subpart Q

1. Purpose & Scope

1.1. This policy is intended as a guide for the safe use of welding and burning equipment.

1.2. This policy applies to all employees and subcontractors working within Absolute Pipeline Maintenance & Consulting controlled job sites.

2. General

2.1. "Hot work" means riveting, welding, flame cutting or other fire or spark-producing operation.

2.2. Only properly trained and instructed employees will be permitted to use electric, oxygen and fuel gas welding, burning and cutting equipment. Supervisors will also be trained in these safety requirements so that they can effectively oversee, manage and enforce safe work operations.

2.3. Employees will be protected from radiant energy eye hazards by spectacles, cup goggles, helmets, hand shields or face shields with filter lenses. Filter lenses will have an appropriate shade number, as indicated in the following table for the work performed. Variations of one or two shade numbers are permissible to suit individual preferences.

Operation	Shade No.
Soldering	2
Torch Brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1-6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Light gas welding, up to 1/8”	4 or 5
Medium gas welding, 1/8 – ½”	5 or 6
Heavy gas welding, over ½”	6 or 8
Shielded Metal-Arc Welding 1/16 to 5/32 - inch electrodes.	10
Inert-gas Metal-Arc Welding (Non-ferrous) 1/16 - to 5/32 - inch electrodes.	11
Shielded Metal-Arc Welding: 3/16 to 1/4 - inch electrodes 5/16 - and 3/8 - inch electrodes	 12 14

2.4. Authorization from the Site Supervisor or, in the shop, the supervisor in charge, before cutting or welding is permitted. The area where hot work will be performed will be inspected by the Site Supervisor or the supervisor in charge. The supervisor will designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.

2.5. To the extent possible, hot work will be performed in designated locations that are free of hazards.

2.6. Hot work will not be performed in flammable or potentially flammable atmospheres, on or in equipment or tanks that have contained flammable gas or liquid or combustible liquid or dust-producing material, until a designated person has tested the atmosphere inside the equipment or tanks and determined that it is not hazardous.

2.7. Regarding fire hazards, if the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity will be taken to a safe place.

2.8. When hot work must be performed in a location that is not free of fire hazards, all necessary precautions will be taken to confine heat, sparks, and slag so that they cannot contact flammable or combustible material. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards will be used to confine the heat sparks and slag and to protect the immovable fire hazards.

2.9. If the safety requirements specified in this program cannot be followed, then welding and cutting will not be performed until it can be done safely and in compliance with company safety rules.

2.10. Drums and containers which contain or have contained flammable or combustible liquids will be kept closed. Empty containers will be removed from the hot work area.

2.11. Inspect all leads torches, hoses, gauges and other equipment daily before use.

2.12. The operator should report any equipment defect or safety hazard to his supervisor and the use of the equipment will be discontinued until its safety has been assured. Repairs will be made only by qualified personnel.

2.13. Always check around and below before commencing hot work operations. Use blankets or other protective devices where required. Cover electrical wires to prevent damage.

2.14. Wear an approved respirator or assure some means of local exhaust ventilation when performing hot work in an area subject to accumulation of fumes and vapor. When in doubt, ask the Site Safety Supervisor/Representative for assistance. Any employee exposed to the same atmosphere as the welder or burner will be protected by the same type of respiratory and other protective equipment as that worn by the welder or burner.

2.15. Hot work activities requiring local ventilation and/or respirators include:

2.16. Zinc bearing base or filler metal or metals coated with zinc bearing materials.

2.16.1. Lead based metals; metals containing lead other than as an impurity or metals coated with lead bearing materials.

2.16.2. Cadmium bearing filler materials; or cadmium coated base materials.

2.16.3. Chromium bearing metals or metals coated with chromium bearing materials.

2.16.4. Beryllium containing base or filler metals. Because of its high toxicity, work involving beryllium will be done with both local exhaust ventilation and air supplied respirators.

2.17. Adequate spark containment methods or barricades will be used when welding burning or cutting overhead.

2.18. Never heat an object lying flat on a concrete floor. Be sure to provide an air space between the material and the floor, as concrete will explode under extreme heat.

3. **Electric Arc Welding and Cutting**

3.1. Personnel designated to operate arc welding equipment will have been properly instructed and qualified to operate such equipment. Personnel assigned to operate or maintain arc welding equipment will be acquainted with both company safety rules and OSHA requirements under Part 1910 Subpart Q - Welding, Cutting, and Brazing.

3.2. Personnel performing gas-shielded arc welding will comply with Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.

3.3. All work will have a separate and adequate ground.

3.4. Welding leads will not be placed in aisles, stairways or landings where they will present tripping hazards. Excessive leads and hoses should be avoided.

3.5. Only manual electrode holders intended for arc welding and cutting and capable of handling the maximum current required for such welding or cutting will be used.

3.6. Current-carrying parts passing through those portions of the holder gripped by the user and through the outer surfaces of the jaws of the holder will be insulated against the maximum voltage to ground.

3.7. Arc welding and cutting cables will be insulated, flexible and capable of handling the maximum current required by the operations, taking into account the duty cycles.

3.8. Only cable free from repair or splice for 10 feet (3 m) from the electrode holder will be used unless insulated connectors or splices with insulating quality equal to that of the cable are provided.

3.9. Insulated connectors of equivalent capacity will be used for connecting or splicing cable. Cable lugs, where used as connectors, will provide electrical contact. Exposed metal parts will be insulated.

3.10. Ground return cables will have current-carrying capacity equal to or exceeding the total maximum output capacities of the welding or cutting units served.

3.11. Before use, arc welding and cutting machine frames will be grounded, either through a third wire in the cable containing the circuit conductor or through a separate wire at the source of the current. Grounding circuits will have resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

3.12. When electrode holders are left unattended, electrodes will be removed and holders placed to prevent employee injury.

3.13. Hot electrode holders will not be dipped in water.

3.14. When arc welders or cutters leave or stop work or when machines are moved, the power supply switch will be kept in the off position.

3.15. Arc welding or cutting equipment having a functional defect will not be used.

3.16. Arc welding and cutting operations will be separated from other operations by shields, screens, or curtains to protect employees in the vicinity from the direct rays and sparks of the arc.

4. Gas Welding & Cutting

4.1. Compressed gas cylinders:

4.1.2. Will have valve protection caps in place except when in use, hooked up or secured for movement. Oil will not be used to lubricate caps;

4.1.3. Will be hoisted only while secured, as on a cradle or pallet, and will not be hoisted by mallet, choker sling or cylinder caps;

4.1.4. Will be moved only by tilting or rolling on their bottom edges;

4.1.5. Will be secured when moved by vehicle;

4.1.6. Will be secured while in use;

4.1.7. Will have valves closed when cylinders are empty, being moved or stored;

4.2. Will be secured upright except when hoisted or carried;

4.3. Will not be freed when frozen by prying the valves or caps with bars or by hitting the valve with a tool;

4.4. Will not be thawed by boiling water;

4.5. Will not be exposed to spark, hot slag, or flame;

4.6. Will be kept away from radiators and other sources of heat;

4.7. Will not be permitted to become part of electrical circuits or have electrodes struck against them to strike arcs;

4.8. Will not be used as rollers or supports;

4.9. Will not have contents used for purposes not authorized by the supplier;

4.10. Will not be used if damaged or defective;

4.11. Will not have gases mixed within, except by gas suppliers;

4.12. Will be stored so that oxygen cylinders are separated from fuel gas cylinders and combustible materials by either a minimum distance of 20 feet (6 m) or a barrier having a fire-resistance rating of 30 minutes;

4.13. Will not have objects that might either damage the safety device or obstruct the valve placed on top of the cylinder when in use.

4.2. Fuel gas will be used only as follows:

4.2.1. Before regulators are connected to cylinder valves, the valves will be opened slightly (cracked) and closed immediately to clear away dust or dirt. Valves will not be cracked if gas could reach possible sources of ignition;

4.2.2. Cylinder valves will be opened slowly to prevent regulator damage and will not be opened more than 1 1/2 turns. Any special wrench required for emergency closing will be positioned on the valve stem during cylinder use. For “manifolded” or coupled cylinders, at least one wrench will be immediately available. Nothing will be placed on top of a cylinder or associated parts when the cylinder is in use.

4.2.3. Pressure-reducing regulators will be attached to cylinder valves when cylinders are supplying torches or devices equipped with shut-off valves;

4.2.4. Cylinder valves will be closed and gas released from the regulator or manifold before regulators are removed;

4.2.5. Leaking fuel gas cylinder valves will be closed and the gland nut tightened. If the leak continues, the cylinder will be tagged, removed from service, and moved to a location where the leak will not be hazardous. If a regulator attached to a valve stops a leak, the cylinder need not be removed from the workplace but will be tagged and may not be used again before it is repaired;

4.2.6. If a plug or safety device leaks, the cylinder will be tagged, removed from service, and moved to a location where the leak will not be hazardous.

4.3. Fuel gas and oxygen hoses will be easily distinguishable from each other by color or sense of touch. Oxygen and fuel hoses will not be interchangeable. Hoses having more than one gas passage will not be used.

4.4. When oxygen and fuel gas hoses are taped together, not more than four (4) of each 12 inches (10.2 cm of each 30.5 cm) will be taped.

4.5. Hose will be inspected before use. Hose subjected to flashback or showing evidence of severe wear or damage will be tested to twice the normal working pressure but not less than 200 p.s.i. (1378.96 kPa) before reuse. Defective hose will not be used.

4.6. Hose coupling will not unlock or disconnect without rotary motion.

4.7. Hose connections will be clamped or securely fastened to withstand twice the normal working pressure but not less than 300 p.s.i. (2068.44 kPa) without leaking.

4.8. Gas hose storage boxes will be ventilated.

4.9. Torch tip openings will only be cleaned with devices designed for that purpose.

4.10. Torches will be inspected before each use for leaking shut-off valves, hose couplings and tip connections. Torches with such defects will not be used.

4.11. Personnel in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems will be instructed and judged competent by their employers for this important work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems will be readily available.

5. **Fire Watch Requirements**

5.1. Fire watchers will be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

5.1.1. Appreciable combustible material, in building construction or contents, closer than 35 feet (10.7 m) to the point of operation.

5.1.2. Appreciable combustibles are more than 35 feet (10.7 m) away but are easily ignited by sparks.

5.1.3. Wall or floor openings within a 35-foot (10.7 m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

5.1.4. Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

5.2. Fire watchers will have fire extinguishing equipment readily available and be trained in its use. They will be familiar with facilities for sounding an alarm in the event of a fire. They will watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch will be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

5.3. Fire Watches will be trained at the worksite by the Site Supervisor. Training is to be documented and employees training files updated to reflect the training.

5.4. Training will be done when employees are initially hired and annually thereafter.

5.5. Refer to Appendix 1 of this section for specific policies and procedures regarding Fire Watch assignment and responsibilities.

6. Working In Confined Spaces

6.1. When hot work, welding, cutting or brazing must be performed in a confined space, only personnel who have successfully completed the company's safety training program and certification for confined space entry will perform such work; and then only with prior authorization from the Site Supervisor utilizing written permit procedures as specified in the company's Confined Space Entry written safety program.

6.2. For purposes of this section, a confined space will mean a relatively small or restricted space (with comparatively examples cited by OSHA being a tank, boiler, pressure vessel, or small compartment of a ship).

6.3. Ventilation is a prerequisite to work in confined spaces.

6.4. When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines will be left on the outside. Before operations are

started, heavy portable equipment mounted on wheels will be securely blocked to prevent accidental movement.

6.5. Where a welder must enter a confined space through a manhole or other small opening, means will be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose they will be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure will be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

6.6. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes will be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.

6.7. In order to eliminate the possibility of gas escaping through leaks of improperly closed valves, when gas welding or cutting, the torch valves will be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight.

6.8. Where practicable the torch and hose will also be removed from the confined space.

6.9. After welding operations are completed, the welder will mark the hot metal or provide some other means of warning other workers.

7. Health Precautions & Ventilation

7.1. The following requirements have been established on the basis of the following three factors in arc and gas welding which govern the amount of contamination to which welders may be exposed:

7.1.1. Dimensions of space in which welding is to be done (with special regard to height of ceiling).

7.1.1.1. Number of welders.

7.1.1.2. Possible evolution of hazardous fumes, gases, or dust according to the metals involved.

7.2. When welding must be performed in a space entirely screened on all sides, the screens will be so arranged that no serious restriction of ventilation exists. It is desirable to have the screens so mounted that they are about 2 feet (0.61 m) above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby workers from the glare of welding.

7.3. Local exhaust or general ventilating systems will be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum concentration allowed by OSHA.

7.4. A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. The suppliers of welding materials will determine the hazard, if any, associated with the use of their materials in welding, cutting, etc.

7.5. All filler metals and fusible granular materials will carry the following notice, as a minimum, on tags, boxes, or other containers:

CAUTION

Welding may produce fumes and gases hazardous to health.
Avoid breathing these fumes and gases. Use adequate ventilation.
See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society.

7.6. Brazing (welding) filler metals containing cadmium in significant amounts will carry the following notice on tags, boxes, or other containers:

WARNING
CONTAINS CADMIUM -- POISONOUS FUMES
MAY BE FORMED ON HEATING
Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators.
See ANSI Z49.1-1967. If chest pain, cough, or fever develops after use, call physician immediately.

7.7. Brazing and gas welding fluxes containing fluorine compounds will have a cautionary wording to indicate that they contain fluorine compounds. One such cautionary wording recommended by the American Welding Society for brazing and gas welding fluxes reads as follows:

CAUTION
CONTAINS FLUORIDES
This flux when heated gives off fumes that may irritate eyes, nose and throat.
Avoid fumes - use only in well-ventilated spaces.
Avoid contact of flux with eyes or skin.
Do not take internally.

7.8. Ventilation for general welding and cutting

7.8.1. Special safety procedures will be taken when welding, cutting or hot work are performed involving fluorine compounds, zinc, lead, beryllium, cadmium, mercury, cleaning compounds, stainless steel, or other exotic metals or paints that release toxic fumes during hot work.

7.8.2. When other metals are welded or cut through hot work, mechanical ventilation will be provided:

7.8.2.1. In a space of less than 10,000 cubic feet (284 m(3)) per welder.

7.8.2.2. In a room having a ceiling height of less than 16 feet (5 m).

7.8.2.3. In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.

7.8.3. Minimum rate. Such ventilation will be at the minimum rate of 2,000 cubic feet (57 m(3)) per minute per welder, except where appropriate local exhaust hoods and booths, or airline respirators approved by the U.S. Bureau of Mines for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations, except for hot work involving fluorine compounds, zinc, lead, beryllium, cadmium, mercury, cleaning compounds, stainless steel or other exotic metals or paints that release toxic fumes during hot work.

7.8.4. Mechanical local exhaust ventilation may be by means of either of the following:

7.8.4.1. Freely movable hoods intended to be placed by the welder as near as practicable to the work being welded and provided with a rate of air-flow sufficient to maintain a velocity in the direction of the hood of 100 linear feet (30 m) per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3-inch (7.6 cm) wide flanged suction opening are shown in the following table:

Welding Zone	Minimum air flow (1) cubic feet / minutes	Duct diameter, inches (2)
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3 1/2
8 to 10 inches from arc or torch	425	4 1/2
10 to 12 inches from arc or torch	600	5 1/2
Footnote (1) When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.		
Footnote (2) Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.		

7.8.5. A fixed enclosure with a top and not less than two sides which surround the welding or cutting operations and with a rate of airflow sufficient to maintain

a velocity away from the welder of not less than 100 linear feet (30 m) per minute.

7.9. Ventilation in confined spaces.

7.9.1. Air replacement. All welding and cutting operations carried on in confined spaces will be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All air replacing that withdrawn will be clean and respirable.

7.9.2. Airline respirators. In circumstances for which it is impossible to provide such ventilation, airline respirators or hose masks approved for this purpose by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR part 84 must be used.

7.9.3. In areas immediately hazardous to life, a full-face piece, pressure-demand, self-contained breathing apparatus or a combination full-face piece, pressure-demand supplied-air respirator with an auxiliary, self-contained air supply approved by NIOSH under 42 CFR part 84 must be used.

7.9.4. Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or self-contained breathing equipment approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, a worker will be stationed on the outside of such confined spaces to insure the safety of those working within.

7.9.5. Oxygen will NEVER be used for ventilation.

8. **First Aid**

8.1. First aid equipment will be available at all times in areas where hot work, welding, cutting or brazing are being performed.

8.2. All injuries will be reported as soon as possible for medical attention.

8.3. First aid will be rendered until medical attention can be provided.

APENDIX 1

Fire Watch & Fire Protection Training

Applicable OSHA Standards: 29 CFR 1910 Subpart L, 1926 Subpart F

1. **Purpose & Scope**

    1.1. To establish methods and guidelines for the training of personnel in fire watch and fire protection.

    1.2. This policy applies to all employees and subcontractors working within Absolute Pipeline Maintenance & Consulting controlled job sites.

2. **Introduction**

    2.1. The Company is responsible for the development and maintenance of an effective fire protection and prevention program at each job site throughout all phases of the construction, repair, alteration, or any demolition work. This training policy/module is intended for personnel working as Fire Watch during burning or welding performed during these activities.

3. **Requirements**

    3.1. Fire Watches will be trained at the worksite by the Site Supervisor.

    3.2. Training is to be documented and employees training files updated to reflect the training.

    3.3. Training will be done when employees are initially hired and annually thereafter.

4. **Training Program Content**

    4.1. Cause and Prevention:

        4.1.1. Fires do not just happen. They are caused by carelessness in operating equipment, handling hazardous materials and personal habits, such as smoking. Even though these actions are not usually deliberate, this still does not lessen the results.

        4.1.2. Only individual employees can protect themselves against these hazards by learning carefully how to prevent fires.

    4.2. The three main components of fire prevention are:

        4.2.1. Be alert for trouble before a fire starts.

        4.2.2. Eliminate unsafe habits that can lead to fires.

        4.2.3. Conduct a fire prevention investigation of your work area prior to work start to remove any potential fire hazards.

4.3. General Fire Prevention Rules:

4.3.1. Employees will become familiar with the four classes of fire, their burning characteristics and the proper extinguishing agent for each:

4.3.1.1. Class A fires involve normal combustibles such as wood or paper. Water is a proper extinguisher.

4.3.1.2. Class B fires involves oils and flammable liquids. CO2 and dry chemicals are the correct extinguishers.

4.3.1.3. Class C fires involve electrical equipment. CO2 and dry chemicals are the correct extinguishers. Never use water on fires involving energized electrical equipment to avoid electrical shock and spreading of fire.

4.3.1.4. Class D fires involve combustible metals and require special approved extinguishing agents.

4.4. Employees must never tamper with or move fire fighting equipment except for actual use.

4.5. Report any equipment defects to your supervisor.

4.6. Employees must know the location and proper operation of all protective fire equipment in the vicinity of their work areas.

4.7. Material and supplies must be stored carefully to prevent falling, spilling, etc.

4.8. All chemicals and solvents must be kept in properly labeled and approved containers.

4.9. Used rags must be kept in metal or metal lined containers having metal covers.

4.10. Never use flammable liquids for cleaning purposes.

4.11. Before using solvents, discuss needed precautions with your supervisor and other parties involved.

4.12. To extinguish a clothing fire on yourself or another person, DROP to the ground AND ROLL to cause a smothering effect or use a fire blanket or other means if available.

4.13. Know primary and secondary exit routes from your area. When an alarm sounds, evacuate immediately. Know site specific codes for emergency pages.

5. **Fire Extinguisher & Other General Information**

NOTE: DO NOT ATTEMPT TO FIGHT A FIRE IF:

- You do not know what is burning;
- The fire is spreading rapidly out of control;
- The fire is between you and your exit or escape path;
- You don't have adequate equipment; or
- You might inhale toxic smoke.

Only trained and qualified personnel are permitted to fight fires. Your training covers only small smolders and fires that are easily put out with a fire extinguisher.

5.1. Employees whose work assignment may require them to use a fire extinguisher shall be trained in such use prior to the job assignment. Training information and instructions on how to use a fire extinguisher safely are explained in Section 7 below.

5.2. All fire extinguishers shall be placed in conspicuous locations near the work area. Know where the nearest fire extinguisher is located, the type of fire it should be used on and how to operate it.

5.3. A fire extinguisher will be within 20-30 feet of flame or ignition type operations in progress.

5.4. All fires, whether they are ignitions or smolders, must be reported to the Site Supervisor, so that an investigation can be initiated to determine cause.

5.5. Any fire extinguisher that has been used shall be returned to the Site Supervisor for replacement.

5.6. Supervisors shall make sure that all employees under their supervision understand the proper use of a fire extinguisher.

5.7. Keep work areas clean and orderly, free of trash and scrap materials as this could prevent small fires from becoming major disasters.

5.8. Keep all passageways, work areas and aisles clean to facilitate evacuation should a fire start.

5.9. Equipment must never be refueled while running or when hot.

5.10. If the piece to be welded or cut cannot be moved to an area free of fire hazards, that hazards shall be removed from the hot work area prior to commencing work. All combustible materials under or near welding or burning operations must be moved to a safe distance away or covered with fire retardant material.

5.11. Guarding shall be used if the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed. Guarding shall effectively confine the heat, sparks, and slag, and to protect the immovable fire hazards.

5.12. Smoking is not allowed on the project except in areas designated as smoking areas. Discard butts in approved containers, not on the floor or in trash cans.

5.13. All fires start because of a combination of ignition source, heat, fuel, and oxygen.

5.14. The primary cause of workplace fires is electrical equipment. These include:

5.14.1. Damaged electrical cords

5.14.2. Loose electrical connections

5.14.3. Overloaded circuits

5.14.4. Defective power tools

5.15. Other common causes of workplace fires include:

5.15.1. Welding and cutting operations

5.15.2. Chemical reactions

5.15.3. Heaters

6. Fire Watch For Welding & Cutting Operations

6.1. Fire Watch personnel shall be aware that that welding sparks can travel as far as 35 feet. Safe procedures prior to and during welding operations are:

6.1.1. Ensure that the area has been checked by an authorized person with a meter for flammable gases and vapors;

6.1.2. Remove any combustibles such as paper, rags, etc;

6.1.3. Have a fire extinguisher and misting hose (if required) on hand;

6.1.4. Assure that proper PPE is on hand and being used; and

6.1.5. Remain 30 minutes after spark producing and welding operations are over to assure that no smoldering or fires break out.

7. **How To Safely Use A Fire Extinguisher** (Instruction for employees)

    7.1. First rule of thumb is “DON’T PANIC.” Keep your calm and wits about you, do not let an adrenaline rush cause you to lose control.

    7.2. Use the extinguisher only for incipient stage fires. In this situation, incipient is defined as the initial or beginning stage when a fire can controlled or extinguished by portable fire extinguishers.

    7.3. Remain at least 8 to 12 feet from the fire as protection from the extinguisher stream blowing hot or burning material to where it could come back at you.

    7.4. Remember the word PASS, which stands for Pull the pin, Aim, Squeeze, and Sweep:

        7.4.1. PULL THE PIN - This will allow you to use the extinguisher.

        7.4.2. AIM AT THE BASE OF THE FIRE - In order to extinguisher a fire you must put out the ignition source at the base of the fire. Stand eight to ten feet from the blaze (if you believe this is a safe-enough distance so that sparks, embers and burning residue will not blow back at you due to the pressure of the extinguisher chemical stream).

        7.4.3. SQUEEZE THE TOP HANDLE OR LEVER - This releases the pressurized extinguishing agent in the extinguisher.

        7.4.4. SWEEP FROM SIDE TO SIDE - Until the fire is completely out. Do not sweep up and down. Then move a safe distance away until you are sure the fire is out.

    7.5. Hands-on instruction will be used for demonstration.

8. **Testing Requirements**

    8.1. On completion of training, participants will be given a written test to support and help ensure their understanding of the information presented.

    8.2. A score of 80% to 99% will require a review of missed questions, with the score corrected to 100% for successful completion of training.

    8.3. A score of below 80% will require complete retraining and re-testing.