PLAN REVIEW	
Reviewer	***Date***
LH	8/14/2014
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Brian Parrie	2/2/2018
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Welding, Cutting and Brazing

Purpose

This plan is designed to help the Comfrey School District comply with the requirements of the Minnesota Department of Education with regards to protecting the health and safety of students and employees who weld, cut, and braze in their curriculum or work activity. Based on OSHA Standards 1910.251-1910.255, this plan has been developed to provide for a safe healthy place for students and staff to learn and work. It is important to note that this plan is written in conjunction with the Compressed Gas Cylinder Plan and is considered to be supportive of that plan. Topic items related to oxygen-fuel gas welding and cutting will be included in this plan by reference.

Given the complexity of the process involved in this plan, 1910.251 is the reference point for resolution of all safety related issues.

As written, this plan is intended to guide the Comfrey School District in its efforts to provide safe equipment, work practices and safety procedures, but will need to be reviewed and modified on a regular basis. The School District is responsible for the enforcement and updating of the plan. Actual use of this plan is limited to Resource Training and Solutions and to the school districts which it represents.

Overview of OSHA Standard 1910.251

OSHA has developed this standard to list the basic precautions required for proper work processes, fire protection and prevention responsibilities for individuals involved in welding, cutting, and brazing activity. Special considerations are delineated for individual's assigned supervisory responsibilities under the standard, which the Comfrey School District interprets to be the responsible instructor in the curriculum

being presented. The Comfrey School District has also designated a person who will be held to the highest standards of training, preparation, and competence in this area.

As written, this plan will provide emphasis in the following areas:

1. Fire prevention and protection
2. Safe work practices and procedures
3. Health protection and ventilation
4. Program review

It is the intent of this plan to prevent accidents and injuries through recognition and the reduction of hazards, proper training, safe work practices, staff training, and program review.

Definitions

Designated Person-Instructor responsible for administering the safety plan including authorizing welding in the area, safety reviews, and working within defined safe work practices.

Energy Source-Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy. Electrical switches are not the only devices that need to be locked out. Sources of air pressure, chemicals, steam, etc. must also be effectively isolated.

Eye Protection-Helmets, goggles, glasses, handheld shields designed to protect the welder or others from the effects of adverse exposure to radiant energy, especially the high yellow spectrum or sodium line.

Lock Box-A box which holds keys that have been used to lock energy isolating devices. The lock box is in turn locked shut by authorized employee's locks. It is used to simplify a group lockout.

Job Lock-An extra lock that is placed on an energy isolating device or a lock box to insure lockout continuity between shifts.

Protective Clothing-Personal protective equipment to protect the welder from effects of heat and sparks; may vary with the size, nature, and location of work being performed.

Safe Work Practices-Policies and procedures developed to ensure that welding and related activity are conducted within the safety precautions established by 1910.251 for each welding activity.

Shade-Amount of protection provided by filter lenses selected according to work being performed and welding, cutting, brazing method in use.

Ventilation-A minimum rate of 2,000 cubic feet per minute per welder; can be varied depending upon local conditions such as where local exhaust hoods are provided.

Welder-Any operator of electric or gas welding and cutting equipment.

NOTE: Additional definitions and hazards are referred to in the School District Compressed Gas Cylinder Plan.

Designated Person

The school district has designated the lead instructor of the metal shop as the responsible person for carrying out the requirements of the plan. Responsibilities include, but are not limited to:

a. Ensure that good housekeeping methods are practiced, including the immediate removal and proper storage of combustible materials, elimination of trip and fall hazards;
b. During welding operations, ensure no combustible materials are present in the area;
c. Ensure that guards are used if the object to be welded or cut be moved and if all of the combustible materials cannot be moved;
d. Develop and implement safety training in the class curriculum so that students are provided in-depth training prior to operating welding or cutting equipment;
e. Ensure that students and others follow safe operating procedures, including wearing the appropriate PPE; and,
f. Review this plan regularly and at least annually recommend updates or changes to the plan forwarding the plan with recommendations to the Administrator for review by the School Board.

General Requirements

1. Fire Prevention and Protection

In all instances, welding, cutting, and brazing activity will be undertaken when the designated person has given permission for such activity to commence. Such permission will ensure that the precautions have been taken to eliminate or minimize the possibility of fire or explosion in the immediate work air. General fire safety practices are followed to ensure that combustible materials are not present in the area where the work activity is scheduled to take place. In all instances, all combustible materials will be removed from the immediate vicinity and properly stored away from any possible exposure to heat or sparks. In the event that it is not possible to remove all combustible materials, guards should be used prevent heat, sparks, and slag from radiating away from the heat source and into the surrounding area. Some areas will require that special precautions be taken to ensure that sparks do not enter closed areas, cracks in floors, holes in walls, or other incidental openings where combustibles might be accidentally ignited.

Fire extinguishers are required to be maintained in the area and in readiness for instant use. It is assumed that the staff supervising these operations will be trained in the safe use of fire extinguishers or will direct that the area be immediately evacuated in the event of a fire emergency. Only staff trained in the use of fire extinguishers shall use them if the situation warrants. The prime directive is to evacuate the area and summon the fire department per district emergency procedures for fire.

2. Personal Protective Equipment

Personal protective equipment will be provided to students and staff at no cost. Personal protective equipment will include welding helmets, gloves, and aprons. This equipment will be provided to the shop in sufficient quantity to protect all students and staff engaged in activity covered by this plan. Any other personal protective equipment preferred or requested by student or staff will be provided on an exception only basis and then only with the recommendation of the designated person and approval of the Superintendent or designee.

At the end of each school day in which this personal protective equipment was used, the class instructor will provide time for the proper cleaning and storage of each piece of personal protective equipment, inspecting each piece daily for cleanliness and integrity. All personal protective equipment will be stored in cabinets, with welding masks hung on provided hooks to prevent them from possible incidental damage.

3. Health Protection and Ventilation

Arc and gas welding create contamination to which students and instructors are readily exposed. The three factors which govern the amount of exposure include:

a. Dimensions of the space in which the welding activity will be completed and is directly related to the height of the ceiling
b. Number of welders or amount of welding activities taking place
c. Possible dusts, gases, and fumes generated by the material being welded

4. Outside or Contractor Coordination

When an outside contractor or party is used to provide services in the shop areas, the shop instructor will ensure that they are made aware of safe work procedures and combustible hazards present in the area in which they will work.

Oxygen-Fuel Gas Welding and Cutting

1. Ventilation

Maximum allowable concentration can be determined by referring to 1910.1000 which is included as Appendix B of this plan. In general welding situations, the minimum ventilation shall be at the minimum rate of 2,000 cubic feet per minute per welder. This exception is where local exhaust hoods and booths with adequate ventilation are provided for each welder.

Ventilation hoods used by welders need to supply a minimum of 100 cubic feet per minute of air flow. The ventilation requirements will vary depending on the material or size of space in which the material is being addressed.

2. Precautionary Labels

Potentially hazardous materials are frequently include in fluxes, coatings, coverings, and filler metals used in the welding and cutting processes or are frequently released into the atmosphere. The hazardous materials most commonly used include: fluorine compounds, zinc, lead, beryllium, cadmium, and mercury. In instances where these materials may be present, it is the responsibility of the supplier to determine the hazard and to notify the designated person that it exists. If so notified, the designated person will be responsible for posting appropriate warning labels and ensuring that the lesson plan provides for adequate protection for the students and staff to avoid inhalation hazards.

Arc Welding and Cutting

1. Equipment

Arc welding equipment shall be selected and maintained in compliance with industry standards, including ANSI and NEMA. Applications need to take into consideration environmental conditions, voltage, and design ensuring maximum safety and least possible exposure to hazards by students and staff. Terminals should be protected from accidental contact. Barrier protection will be provided between welding stations to protect students from burns created by sparks and slag. When the welding operation has been completed, the welding rod shall be removed from the holder and the holder placed in a non-conductive sleeve or other apparatus to provide protection in the event of an accidental activation of the welder.

2. Maintenance and Inspection

Arc welding equipment will be inspected regularly by staff to ensure that the cables and holders are in good working condition. Defective equipment will be removed from service until repairs have been completed.

Resistance Welding

1. Guarding

All welders shall be equipped with emergency stops and power outage protection in the immediate vicinity of the operator along with lock-out/tag-out procedures established and equipment provided. A welding-spark splash guard will also be provided along with guards on foot switches to prevent accidental operation.

The District personnel whose job functions include welding, cutting, and/or brazing, whether actually working in the activity or providing student instruction, shall receive training prior to any initial use or work assignments and an annual refresher thereafter. This training may be combined with the district's Employee Right-to-Know training program as well with other job related training programs.

Specific topics to be covered during training for employees shall include:

- Fire prevention practices
- Personal Protective Equipment-proper selection, use, and maintenance
- Health Protection
- Proper ventilation
- Labeling
- Equipment-proper selection, use, and maintenance

A sample training log can be found in Appendix A.

Recordkeeping

The school district will retain training records for each employee for a period of five years (minimum). Training records will include the date the training took place, a copy of the agenda and outline of the training, and a log signed with legible signatures.