



Republic of the Philippines  
**Department of Education**  
National Capital Region  
Schools Division Office – Muntinlupa City

**SPECIAL PROGRAM FOR TECHNICAL VOCATIONAL EDUCATION (SPTVE)**  
**SHIELDED METAL ARC WELDING 7 / QUARTER 3 WEEK 3**

I. Topic: Apply Safety Practices

II. Objectives: 1. Identify hazards in accordance with OHS (occupational health and safety) procedures;  
2. Identify and adhere to safety signs and symbols in accordance with workplace safety procedure;  
3. value the importance of occupational health and safety in SMAW.

III. Brief Introduction of the Lesson

**Environmental Hazards**

1. **Physical Hazards.** Hazards due to the transfer of energy between an object and a worker.
2. **Chemical Hazards.** These hazards arise from inhaling chemical agents in the form of vapor gases, dust, fumes, mist, or by skin contact with these materials.
3. **Biological Hazards.** Hazards caused by living organisms which include insects, molds, fungi, viruses, and bacterial contamination; from defects in sanitation and housekeeping procedures. Some of the common Health Problems from Biological Hazards are Tuberculosis (TB), Tetanus, Viral Hepatitis and HIV/AIDS. Some diseases caused by virus **are** uUpper Respiratory Tract Infection, Hepatitis B Infection, Acquired Immunodeficiency Syndrome (AIDS) and Rabies
4. **Ergonomic Hazards.** (Ergonomics is the study of designing equipment and devices that fit the workers) Hazards commonly seen in the workplace, which are improperly designed tools or work areas, improper lifting or reaching, poor visual conditions or repeated motions in an awkward position that may be responsible for fatigue, stress and strain and may lead to accidents in the occupational environment.

**Effects of Ergonomic Hazards** are low productivity, high rate of errors, material wastage and equipment

**Health Problems caused by Ergonomics** are musculoskeletal problems, vascular problems, visual problems, hearing problems, skin problem and psychological problem.

**Welding Safety**

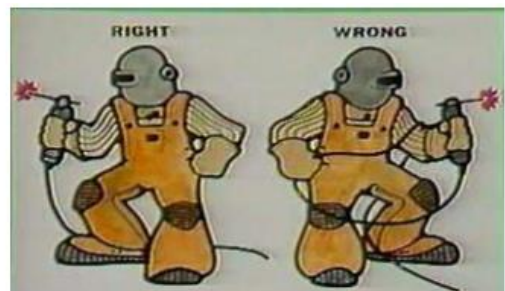
1. **Electric shock** – maybe caused by open and not properly insulated cable, workers are advised to regularly check electrical wiring connection.



Check primary circuit wiring connection



Check welding cable for crack or cut insulation



Do not put welding cable around the part of your body.





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2. **Arc rays** can damage both eyes and skin, so wear proper protective clothing and filter lenses.
3. **Fumes and Gases**- Use proper ventilation and position yourself out of the fume flow
4. **Fire and explosion**- may result from faulty welding operation .Always understand the environment where you are welding and never take anything for granted.
5. **Compressed gas**- must be handled in such a way as to prevent personal or equipment damage.
6. **Face and eye protection** - must be worn at all times in the workplace. This includes safety goggles and full -faced mask.



Dangerous powder dust comes from weld fumes filtered during welding

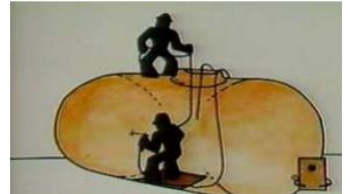


Figure 1 PROPER PROCEDURE FOR WELDING IN A TANK

### Safety Signs and Symbols

Safety symbols are pictures sometimes called safety pictographs, pictograms, or pictorials. They are used in place of, or as a supplement to written words. These symbols provide warnings or alerts about a possible hazard.

Because pictures may convey information better than words, graphic symbols are added to precautionary labels to show major workplace dangers like welding or cutting hazards.

Welding and cutting industry has adopted standardized symbols and uniform methods of use to avoid user confusion and to supplement and reinforce the written message

**Words** The large word at the top of the label is called the signal word. It is used in combination with a specific colored background and combined with the safety alert symbol to indicate the degree of seriousness of a potential hazard. Because of its colored background, the signal word is usually the first element that you notice when looking at a safety label. According to International Standard Organization (ISO), there are three (3) choices for a signal word:

1. **DANGER**. Used to indicate an imminently hazardous situation which, if avoided, will result in death or serious injury. The use of this signal word should be limited to the most extreme situations.
2. **WARNING**. This indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
3. **CAUTION**. Used to indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. CAUTION may also be used without the safety color symbol (the triangle with exclamation mark) to indicate property-damage-only.





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**Classification of Safety Signs**

1. **Regulatory Signs**- signs contain instructions. Failure to comply with them constitutes an offense under law, standing orders, company policy, etc. a. **Mandatory signs** are regulatory signs which indicate that an instruction must be carried out. When symbols are used they are white on a blue disc. Text-only mandatory signs are black on white in a portrait format
2. **Prohibition signs** are regulatory signs which indicate that an action or activity is not allowed. The symbolic shape used on prohibition signs is the red circle and slash over a black symbol. Prohibition signs may contain only the red circle and text with no symbol.
3. **Warning Signs**- signs which warn of a hazard or hazardous condition that is not likely to be life-threatening. The symbolic shape used on warning signs is black triangle with yellow interior and black symbol. The word warning is not required to print on the sign, although it is often used for added impact.




**IV. Activities:**

**Activity 1.** Identify the term that is described in column A. Choose your answer from column B

**COLUMN A**

1. The most common and painful injuries that occur in the welding shop.
2. An immediate care given to a person who has been injured or suddenly taken illness.
3. A symbol used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**COLUMN B**

- a. Welding shields/helmet
- b. Occupational safety health standard
- c. Burn





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4. Mandatory rules and standards set and enforced to eliminate or reduce hazards in the workplace. d. first aid
5. It is used to protect our face and eyes from the arc rays and heat and the spatter from the molten metal. e. caution  
f. hazard

**Activity 2.** Classify the following safety signs.



**Activity 3.** Write down at least 5 common health problems from biological hazards and 5 diseases caused by virus.

V. Assessment: (5 items only) Direction: Read, analyse, and choose the letter of the best answer.

1. Which hazards are due to transfer of energy between an object and a worker?  
A. Chemical hazards    B. Physical hazards    C. Biological hazards    D. Ergonomics hazards
2. Which kind of hazard causes deadening of a welder's hand because of unadvisable position during welding?  
A. Chemical hazards    B. Physical hazards    C. Biological hazards    D. Ergonomics hazards
3. Signs which indicate that an action is not allowed are \_\_\_\_\_.  
A. regulatory signs    B. mandatory signs    C. prohibition signs    D. warning signs
4. Signs indicate that an instruction must be carried out \_\_\_\_\_.  
A. regulatory signs    B. mandatory signs    C. prohibition signs    D. warning signs
5. Which used to indicate an imminently hazardous situation which, if avoided, may result in death or serious injury?  
A. Danger    B. Warning    C. Caution    D. Emergency

VI. Reflection: Answer this question in 2-3 sentences. Why is it important to follow all the OHS (occupational health and safety) standards in SMAW?

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