

## hot work - GHSC

### 1. Hot+Work-Welding-Cutting-Brazing-Safety+

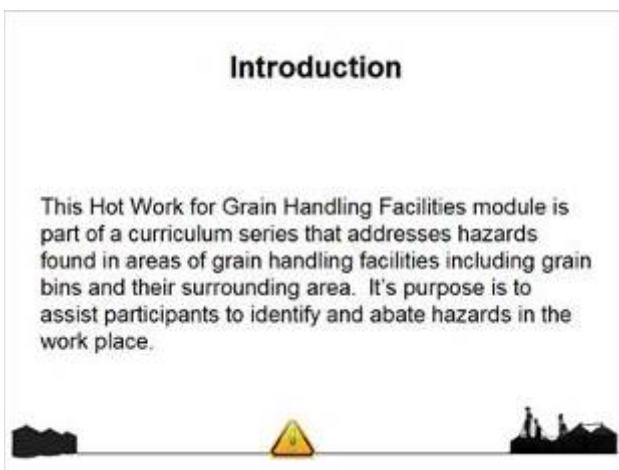
#### 1.1 *Welding, Cutting, and Brazing*



#### Notes:

Welcome to Hot Work at Grain Handling Facilities Training Module.

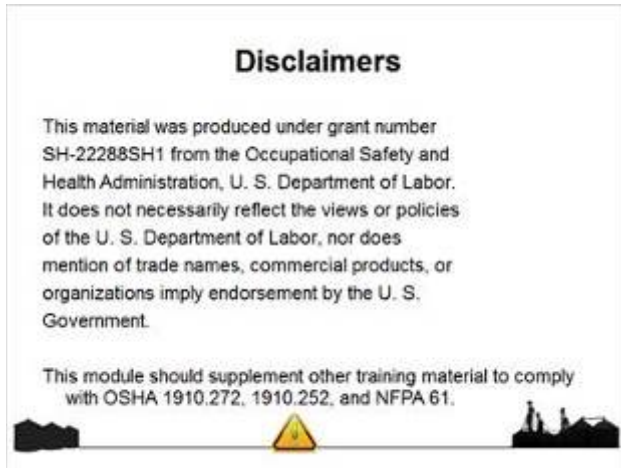
#### 1.2 *Introduction*



#### Notes:

This Hot Work for Grain Handling Facilities module is part of a curriculum series that addresses hazards found in areas of grain handling facilities including grain bins and their surrounding area. Its purpose is to assist participants to identify and abate hazards in the work place.

### 1.3 Disclaimers



#### Notes:

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This module should supplement other training materials to comply with OSHA 1910.272, 1910.252, and NFPA 61.

## 1.4 Employee Rights



### Notes:

Employees are entitled to safe and healthy working conditions which DO NOT pose a risk of serious harm.

Workers are entitled to be fairly compensated for all hours worked in accordance with the law.

## 1.5 Employer Responsibility



### Notes:

Employers have the responsibility to provide a safe workplace.

7.


More information about employer & employee rights can be found at [www.osha.gov](http://www.osha.gov).

## **1.6 Learning Objectives**

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At the end of this module, participants will be able to:

- Identify tasks that are considered hot work.
- Identify fire watch responsibilities.



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## **1.7 Learning Objectives**

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At the end of this module, participants will understand:

- Hot work permit recommendations
- General safe work practices for hot work
- PPE requirements

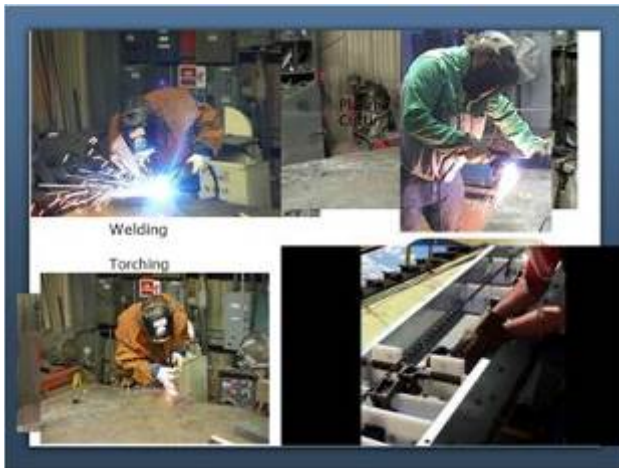


## Notes:

At the end of this module, participants will understand:

- Hot work permit recommendations
- 
- General safe work practices for hot work
- 
- PPE requirements

## 1.8 Hot work examples



## Notes:

The official definition of “hot work” is work involving electric or gas welding, cutting, brazing, or similar flame producing operations.

The definition is normally expanded to include work that is heat or spark creating. This pulls in grinding and a few other activities.

Welding is hot work.

Plasma cutting is hot work.

Torching is hot work.

Grinding is a spark producing activity and should be considered hot work per the Guidance to Inspectors document on hot work.

## 1.9 filling out a permit



### Notes:

The implementation of a permit system for hot work is intended to assure that employers maintain control over operations involving hot work and to assure that employees are aware of and utilize appropriate safeguards when conducting these activities.

The permit is not a record, but is an authorization of the employer certifying that certain safety precautions have been implemented prior to the beginning of work operations.

## 1.10 Hot Work program guidelines

**Hot Work program guidelines**

**DANGER**

- NO SMOKING
- Open flame is prohibited
- Flame should stop for general Disturbance Safety
- Flammable may exist in the Class II, Div 1, Group II
- Ignition sources should be controlled and restricted
- Use hot "tag" always
- Hot Work - Permits required and performed by:
  - Authorized Personnel Only
  - Restricted Access - Authorized Personnel Only
  - Wear appropriate PPE at all times

except: (e.g., shop areas, fire facility)

NFPA 61 discusses spark producing tools in their hot work section and the need for dust producing equipment in the area to be off and also the cleaning requirements. A Portable Power Tool permit would be a best practice to meet the requirements.

## Notes:

The permitting system is required for all hot work (except pre-approved areas such as maintenance shops, garage welding areas, outdoors, etc.). We suggest that hot work done outside within 50 feet of the grain handling facility also be controlled by a permit as a good practice.

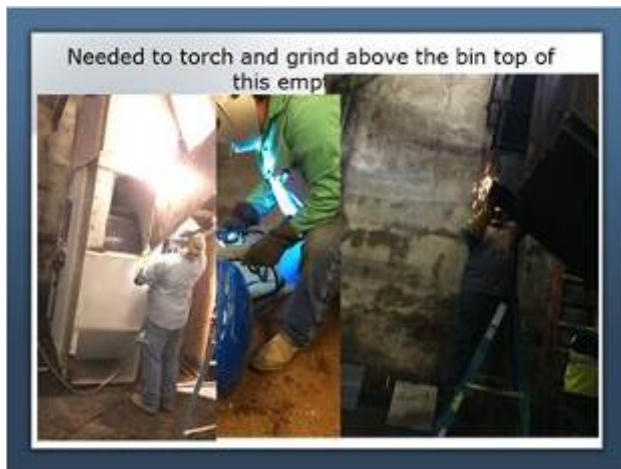
NFPA 61 discusses spark producing tools and the need to shut down dust producing equipment and it lists the cleaning requirements. We suggest a Portable Power Tool Permit to be certain that basic precautions and conditions have been met.

Obtain and complete Proper permit.

Hot Work Permit

Portable Power Equipment Permit when in the facility.

## 1.11 Hot Work Example



## Notes:

If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.

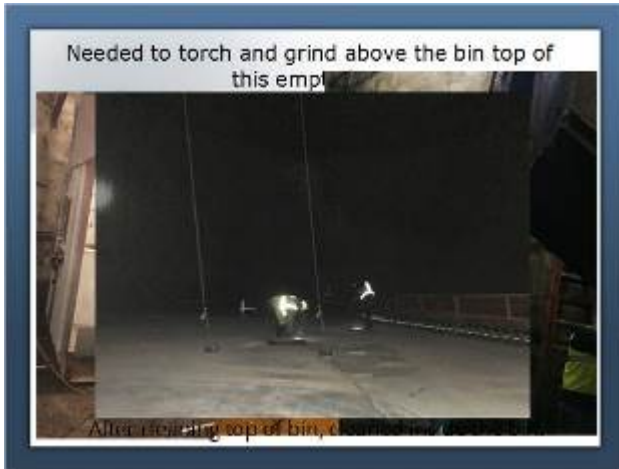
If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

If these requirements cannot be followed then welding and cutting **shall not** be performed.

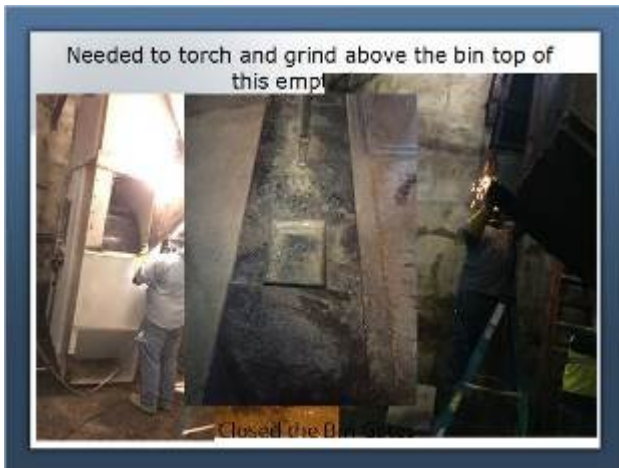
In the situation portrayed here, after cleaning the top of bin, cleaning the inside of bin, and wetting the inside down, a piece of a broken tape measure handle was missed on the bin top and torch drippings

ignited the handle and the fire watch spotted and handled the situation. You need to be thorough in your preparation.

### Cleaned Inside (Slide Layer)

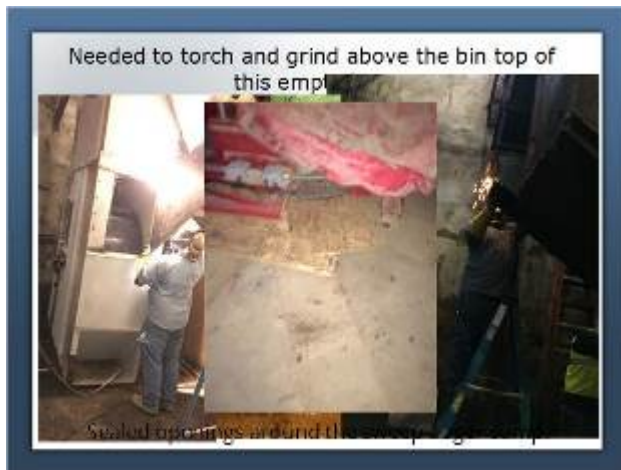


### Closed Gates (Slide Layer)





## Sealed Openings (Slide Layer)



## Wet down (Slide Layer)



## Burnt handle (Slide Layer)



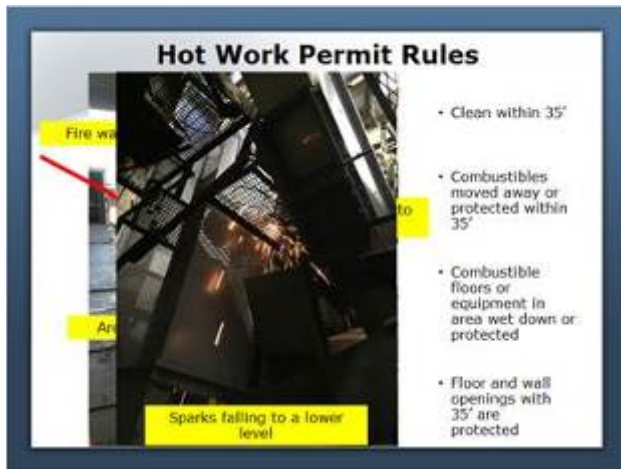
### 1.12 Hot Work Permit Rules



#### Notes:

Before any Hot Work in a grain handling facility may be performed (unless in approved shop or approved outside area), a Hot Work Permit must be completed.

### 1.13 Hot Work Permit Rules



#### Notes:

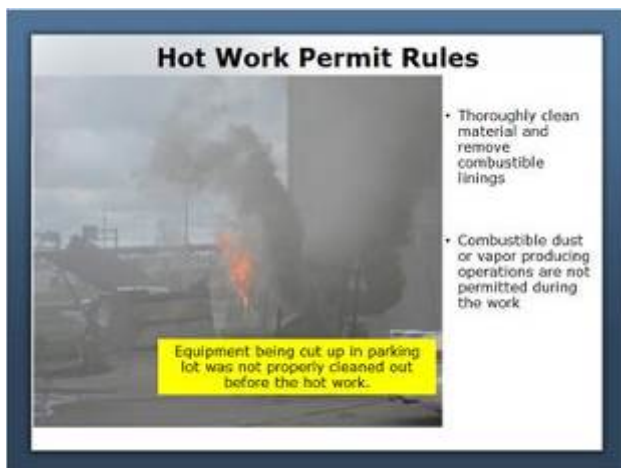
The area within 35 feet of the work shall be cleaned of dust.

Other combustibles within 35 feet of the work shall be moved or protected with covers, guards, or shields.

Combustible Floors or equipment in or below the work area shall be wet down or covered with damp sand, metal shields, or fire retardant blankets or tarps.

Floor and wall openings within 35 feet of the work shall be covered or closed, and all open spouts in the work area shall be sealed or plugged.

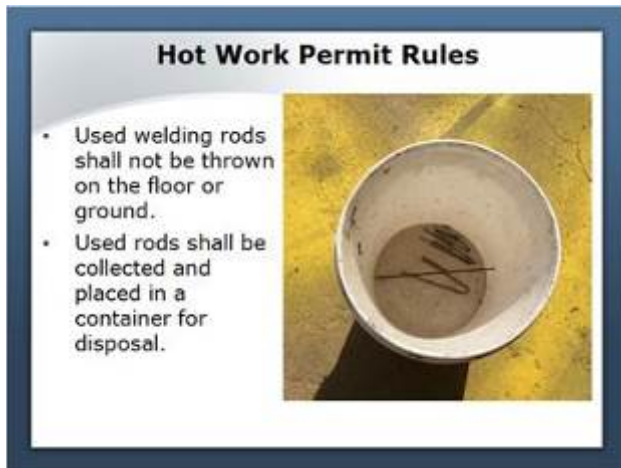
### 1.14 Hot Work Permit Rules



**Notes:**

All Equipment shall be thoroughly cleaned of combustible material and oil residues, and any exposed combustible linings shall be removed.

Combustible dust or flammable vapor-producing machinery or operations in the area shall not be permitted to be operating during the work.

**1.15 Hot Work Permit Rules****Notes:**

Used welding rods shall not be thrown on the floor or ground. Used rods shall be collected and placed in a container for disposal.

## 1.16 Hot Work Permit Rules



### Notes:

Welding rods are never left in the welding leads and all welding cables, power cords, ground wiring and accessories are maintained in safe operating condition.

## 1.17 Hot Work Permit Rules



### Notes:

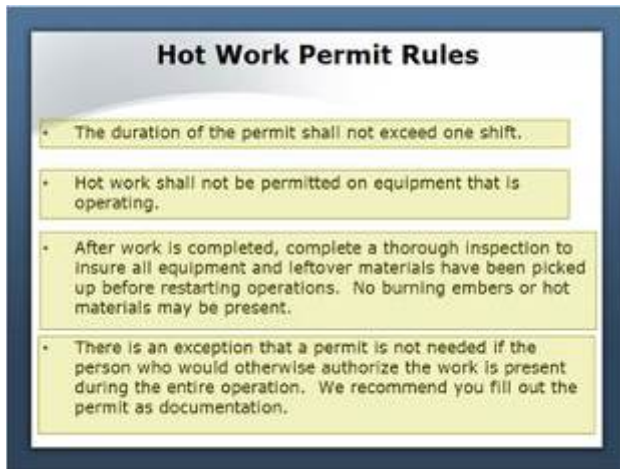
Fire Watch personnel cannot be assigned to other duties.

Fire Watch personnel are looking for potential fire hazards, fire conditions, unsafe conditions, or changing conditions, etc.

A Fire Watch supplied with suitable portable extinguishers or a water hose shall be maintained during the work and for at least 30 minutes after the work is completed. NFPA 61 requires a 1-hour fire watch.

Fire Watch must be equipped with a communication device and shall call for help or assistance as needed.

## **1.18 Hot Work Permit Rules**



### **Notes:**

The duration of the permit shall not exceed one shift.

Hot work shall not be permitted on equipment that is operating.

After work is completed, complete a thorough inspection to insure all equipment and leftover materials have been picked up before restarting operations. No burning embers or hot materials may be present.

There is an exception that a permit is not needed if the person who would otherwise authorize the work is present during the entire operation. We recommend you fill out the permit as documentation.

-

## 1.19 Hot Work Permit

**Hot Work Permit**

Date: \_\_\_\_\_

Time Begins: \_\_\_\_\_

Time Expires (not to exceed 1 shift): \_\_\_\_\_

Location of the work: \_\_\_\_\_

Description of the work: \_\_\_\_\_

Person(s) performing the work: \_\_\_\_\_

The flame or spark producing equipment has been inspected and found to be in safe condition.

All necessary PPE has been provided to workers. Instructions for use and inspection completed.

All of the following procedures must be taken before cutting, welding, or other heat or spark producing is started:

YES	N/A	
		The area within 25 feet of the work shall be cleaned of dust.
		Other combustibles within 25 feet of the work shall be removed or protected with covers, guards, or shields.

### Notes:

Here is an example of a hot work permit.

- It contains basic information like the date, the time the work begins, the time the permit expires, definitely not exceeding 1 shift.

The location of where the work will be done. The description of the work to be done.

Who will be performing the work.

And then, a basic checklist of some of the safety items the basic safety items

## 1.20 Welding hazards

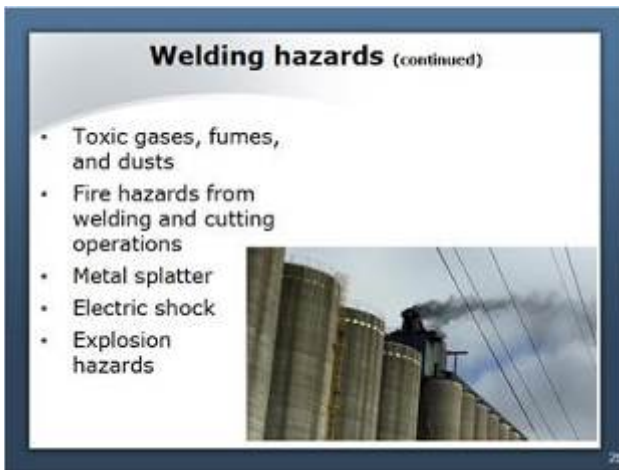


**Notes:**

If welding, there may be damage to eyes and skin from ultraviolet (UV) rays or infrared rays. You need to protect your eyes and skin and you need to protect others in the area as well.

If performing hot work on a closed container, there may be explosion and fire hazards. You need to purge and clean closed containers prior to welding operations

**1.21 Welding hazards (continued)**



**Notes:**

Other hazards from hot work can be:  
Toxic gases, fumes, and other dusts.

There can be.....Fire hazards from welding and cutting operations

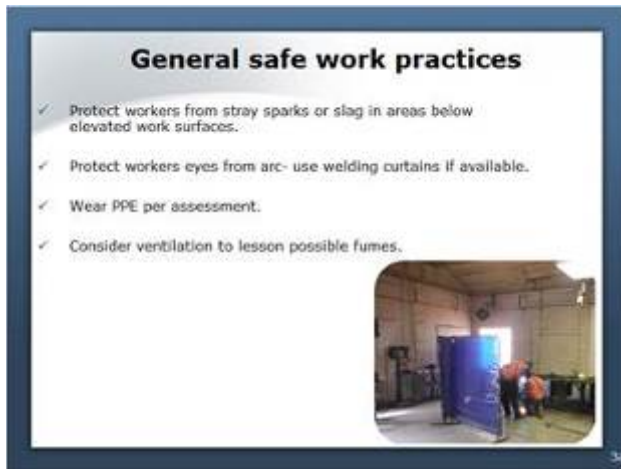
There can be .....Metal splatter

There can be .....Electric shock

There can be .....Explosion hazards



## 1.22 General safe work practices



### Notes:

Protect workers from stray sparks or slag in areas below elevated work surfaces.

Protect workers eyes from arc- use welding curtains if available.

Wear PPE per the assessment.

Consider ventilation to lesson possible fumes.

## 1.23 General safe work practices



### Notes:

Warn others of hot metal by marking work areas (i.e. safety cones, caution tape, warning signs).

Keep floor areas clear of electrodes and/or electrode stubs.

Cover hazardous areas with fire resistant cover (i.e. flammable materials).

### ***1.24 General safe work practices***



#### **Notes:**

Never use bare conductors, damaged equipment.

Never arc weld or resist weld while standing on damp surfaces.

### ***1.25 Fire watchers will:***



## Notes:

Check the hot work areas for at least one hour after hot work operations have ceased (OSHA requires half an hour and NFPA 61 says one hour. So we recommend continuously for the first 30 minutes and periodically for the next 30 minutes).

Follow the time frame specified on Hot Work Permit and know emergency contact information on Hot Work Permit.

## 1.26 Designated Hot Work Areas (Pre-Approved)



## Notes:

Whenever practical perform Hot Work in areas designated for Hot Work (i.e. Maintenance Shop areas that have a clear area of more than 35 feet from flammables, that are equipped with ventilation, and have fire extinguishers).

## 1.27 Portable Power Equipment



## Notes:

All spark or arc producing portable power equipment (corded or cordless) shall require a Portable Power Equipment Permit.

The area must be shut down and hot work precautions taken before a Permit may be issued. There should be no dust or flammable materials in the area or on the equipment to be worked on.

The portable power equipment must be inspected and be in safe condition.

## 1.28 Portable Power Equipment Permit

**PORTABLE POWER EQUIPMENT PERMIT**

NOTE: This permit must be filled out completely before portable power equipment not used for the hazardous location is permitted inside the grain handling facility.

Facility \_\_\_\_\_ Date \_\_\_\_\_

Area of Facility \_\_\_\_\_

Name of Portable Power Equipment \_\_\_\_\_

Description of Work \_\_\_\_\_

Name of Person Performing the Work \_\_\_\_\_

**SAFETY REQUIREMENTS**

1. Affected area within the grain handling facility shut down.
2. Work area clean and dry.
3. Equipment inspected and any cords and plugs in good condition.
4. No chance of significant airborne dust in the area or on the equipment being worked on.
5. No visible airborne dust in the area.

Permit Approval \_\_\_\_\_ Manager/Supervisor \_\_\_\_\_

## Notes:

Here is an example of a Portable Power Equipment Permit that may be used.

It contains basic information that must be filled out prior to the work: Area of the facility being worked on

The name of the portable power equipment

The description of the work to be done

Who will be doing the work

It also contains a safety requirement checklist that must be completed prior to starting the work.

### 1.29 Does this activity require a hot work permit?



#### Notes:

Does this activity require a hot work permit?

Yes, this activity requires a hot work permit because it is within 50' of the grain handling facility. This is based on our recommendation that you must be 50' away from the grain handling facility to deem the work safe concerning potential grain hazards.

### 1.30 What types of safety issues do you see?



#### Notes:

What types of safety issues do you see?

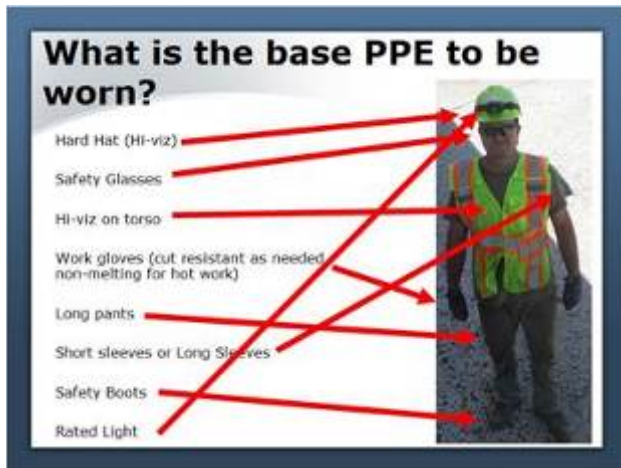
The employee is not wearing the proper PPE.

Shaded glasses, gloves and sleeves are required.

Also, it is very apparent that he did not clean up the dust in the area.

Also, where is the fire watch? The fire watch is not apparent in this picture.

### **1.31 What is the base PPE to be worn?**



#### **Notes:**

Good base PPE to be worn in grain operations would be:

A hard hat, which in this case is high-visibility.

Safety glasses.

Hi-Visibility on at least the torso.

Gloves - work gloves for routine work, cut resistant gloves if working with sharp materials, non-melting gloves for hot work.

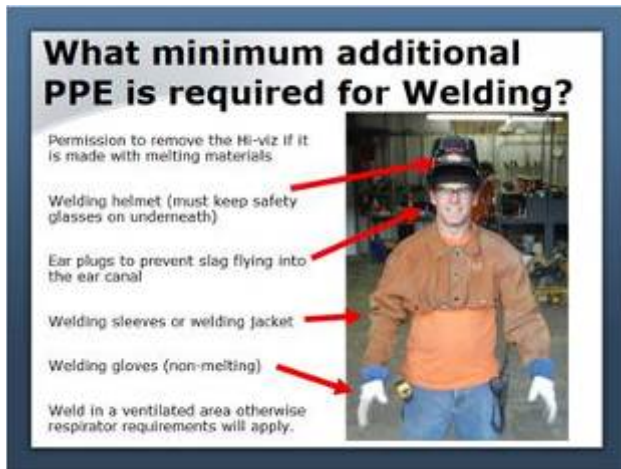
Long pants.

Long or short sleeves of natural fiber or FR materials.

Safety boots.

Employees working during dark hours should have a rated headlamp or light.

### 1.32 What minimum additional PPE is required for Welding?



#### Notes:

You have permission to remove a Hi-Viz vest or jacket if it is made with melting materials

A welding helmet must be worn. You can remove your regular hardhat. You must wear your safety glasses under the welding helmet.

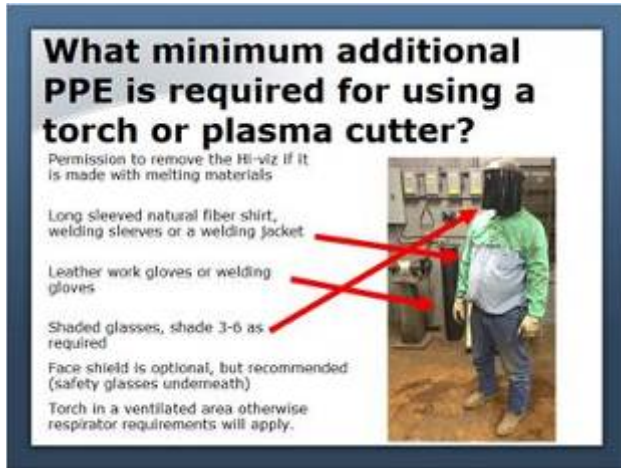
Ear plugs must be worn to prevent slag from flying into the ear canal.

Welding sleeves or a welding jacket must be worn.

Welding gloves, usually a thick leather glove, must be worn. Do not wear a glove that can melt.

Weld in a ventilated area; otherwise, respirator requirements will apply.

### ***1.33 What minimum additional PPE is required for using a torch or plasma cutter?***



#### **Notes:**

You have permission to remove a Hi-Viz vest or jacket if it is made with melting materials

A long sleeved natural fiber shirt, welding sleeves, or a welding jacket must be worn.

Leather work gloves or welding gloves must be worn. Do not wear a glove that can melt.

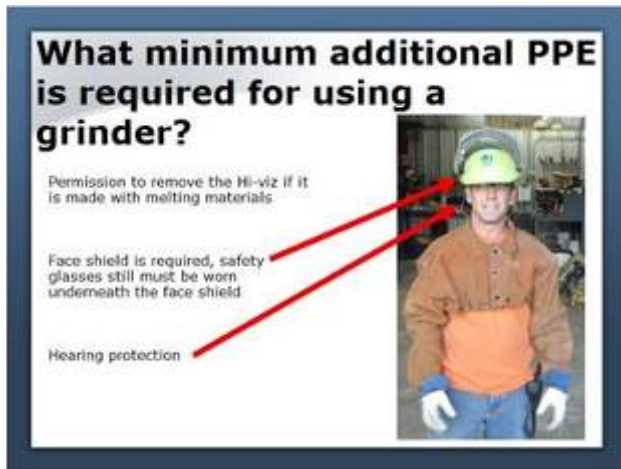
Shaded safety glasses must be worn. Shade 3 through 6 is the normal range.

A face shield is optional, but recommended.

Torch in a ventilated area; otherwise, respirator requirements will apply.



### ***1.34 What minimum additional PPE is required for using a grinder?***



#### **Notes:**

You have permission to remove a Hi-Viz vest or jacket if it is made with melting materials

A face shield is required when grinding. Safety glasses still must be worn underneath the face shield.

Hearing protection is required. Ear plugs or ear muffs.

### ***1.35 Thank you for completing the hot work training.***



#### **Notes:**

Thank you for completing the hot work training.

## 2. Video Scene

### 2.1 Untitled Slide

