

PREVENTING FIRES DURING HOT WORK OPERATIONS

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

INTRODUCTION: A brief description of the program and the subject that it addresses.

PROGRAM OUTLINE: Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

PREPARING FOR AND CONDUCTING THE PRESENTATION: These sections will help you set up the training environment, help you relate the program to site-specific incidents, and provide program objectives for focusing your presentation.

REVIEW QUESTIONS AND ANSWERS: Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

INTRODUCTION

Welding, grinding, cutting, open flame and other spark producing tools and operations are all capable of starting dangerous fires in our workplaces. Collectively known as hot work, such processes require specific permits and procedures be followed to prevent the ignition of vapors, liquids and solids that may be in or near the work area. Careless hot work operations can quickly lead to fires, extensive property damage, severe injuries or death. This program discusses the safe work practices that should be taken to prevent such incidents and reviews the responsibilities of those workers involved in hot work tasks.

Topics include the hot work safety program, designated hot work areas, safety precautions to be taken prior to a hot work operation, the circumstances that require a fire watch, communication with outside contractors and responsibilities of the permit authorizing individual, the fire watch and the hot work operator.

PROGRAM OUTLINE

THE HOT WORK SAFETY PROGRAM

- Preventing injury and property damage during hot work operations is the purpose of your facility's hot work safety program.
- Hot work can be defined as "work that involves open flame, sparks and heat-producing activities." These types of activities are commonly associated with welding, cutting, grinding and brazing operations.
- Many companies have developed a written hot work safety program. Some topics covered in a typical written program include:
 - a) The duties of those workers authorized to verify that conditions are acceptable for hot work to be performed and issue hot work permits;
 - b) The types of fire suppression equipment used at the facility;
 - c) The training and safe work practices required for those employees who perform hot work or stand fire watch;
 - d) The locations onsite, known as non-permissible areas, where hot work is not permitted due to the severity of nearby hazards;
 - e) The format of hot work permits used at the facility as well as an overview of the system used to issue and manage the permitting process.

DESIGNATED HOT WORK AREAS

- In most circumstances, hot work involves some type of maintenance work or fabrication. Some work areas have been designed as a safe and permanent location for hot work to be performed.
- These “designated areas” for hot work should be free of combustible materials, have a non-combustible working surface, be equipped with appropriate mechanical ventilation, have a fire extinguisher and be suitably segregated from adjacent work areas.
- When possible, objects requiring hot work should be moved into a designated hot work area.
- When hot work is performed in these types of approved and designated areas a hot work permit is not required; however, there are often times when a piece of equipment is too large to move into a designated area or the work to be done involve pipes and other objects, which must be left in place.

HOT WORK PERMITS

- When this is the case and hot work must be performed in a “non-designated” area, a hot work permit will be required.
- The hot work permit will outline the special precautions which must be taken to ensure everyone’s safety during hot work operations.
- The person who issues the hot work permit, called the permit authorizing individual or “PAI” by some organizations, must verify all precautionary measures have been taken before signing the permit and allowing work to begin.

SAFETY PRECAUTIONS TO TAKE PRIOR TO A HOT WORK OPERATION

- The equipment used for performing the hot work operation or task should be inspected to ensure it is in good operating condition.
- Before beginning work, employees involved in the hot work must select the appropriate personal protective equipment and clothing.
- Wood shavings, paper clippings and other ignitable debris should be swept clean for a radius of at least 35 feet from the worksite.
- If the floor is composed of material that could ignite, it should be wet down, covered in wet sand or covered in approved welding blankets or pads.
- All ignitable materials should be removed to a location at least 35 feet from any possible ignition source.
- If materials or objects that could ignite cannot be moved, they should be covered by an approved welding curtain, blanket or pad or a welding screen should be placed in front of them to prevent contact with sparks, slag or anything else that could cause them to ignite.
- The same is true of any ceilings, walls, partitions and roofs within a 35-foot radius of the worksite.
- If hot work is done on one side of a wall, partition, ceiling or roof, combustibles on the other side must also be removed or a fire watch must be stationed if relocating the combustibles is impractical.
- Openings or cracks in walls or floors within 35 feet must also be covered or sealed with an approved material to prevent the passage of sparks.
- Ducts and moving conveyors that could carry sparks to ignitable materials in other locations must be shielded or shut down, or both.

- Fully charged and operable fire extinguishers, appropriate for the class of any potential fire, must be readily available in the work area.
- Precautions must also be taken to prevent the accidental operation of sprinkler systems and other automatic fire suppression methods while the hot work is being performed.

DUTIES OF THE PERMIT AUTHORIZING INDIVIDUAL (PAI)

- In situations where sparks, slag, or other ignition sources may travel farther than 35 feet, the permit authorizing individual may extend the distance of the combustible-free zone.
- On the other hand, the PAI may reduce the distance below 35 feet if he or she considers the smaller area to be safe from fire. The distance and area of the combustible-free zone must be described on the hot work permit.
- Based on local conditions, the permit authorizing individual will determine the length of time for which the permit is valid.
- The PAI must inspect the hot work area at least once per day while the permit is in effect to make sure it is safe from fire.
- Upon notice that the work has been completed, the PAI will verify that the area is safe and then close out the permit in accordance with your organization's policies.
- Any fire suppression systems that were shut down during the work must be reactivated.
- The hot work permit is then stored for a period of time specified in the company's written hot work safety program.

CIRCUMSTANCES THAT REQUIRE A FIRE WATCH

- Many hot work operations require a fire watch. A fire watch is a properly trained and authorized person responsible for keeping the hot work operation in a fire-safe condition as well as watching for fires after the work is completed.
- Some facilities require a fire watch anytime hot work requiring a permit is performed: otherwise, a fire watch is required under the following conditions:
 - 1) When hot work is performed in locations where something "other than a minor fire" might develop or where the following conditions exist;
 - 2) When appreciable combustible materials in building construction or contents are closer than 35 feet to the point of operation;
 - 3) When appreciable combustible materials are more than 35 feet from the work but can easily be ignited;
 - 4) When wall or floor openings within a 35 foot radius expose combustible materials in adjacent areas, including concealed spaces in walls or floors;
 - 5) When combustible materials are adjacent to the opposite side of partitions, walls, ceilings or roofs and are likely to be ignited by combustion or heat radiation.

RESPONSIBILITIES OF THE FIRE WATCH

- The fire watch must be performed by someone who understands the hazards of the hot work being performed and the limitations placed on the hot work operation by the permit and the permit authorizing individual.

- The fire watch has the responsibility to make certain the hot work area is maintained in a fire-safe condition throughout the performance of the hot work and has the authority to stop the hot work if unsafe conditions are observed.
- The fire watch should be properly trained in the use of fire extinguishers and have an appropriate extinguisher readily available during a hot work operation.
- The fire watch should only attempt to extinguish a fire which is obviously within the capacity of the extinguishing equipment available.
- The fire watch must be stationed in the area for at least one half hour after completion of the hot work in order to detect and extinguish smoldering fires.
- This duration of the fire watch may be extended if the permit authorizing individual determines that the fire hazards warrant an extension.
- More than one fire watch is required if combustible materials that could be ignited by the work cannot be directly observed by a single fire watch.
- Keep in mind that a fire watch is not a replacement for proper planning or working safely. Preventing fires is the goal of safe hot work operations regardless of the firefighting equipment available or the capabilities of the workers involved.

RESPONSIBILITIES OF THE HOT WORK OPERATOR

Before Beginning The Operation

- Whether it be welding, cutting, grinding, brazing or some other task, any employee performing hot work must wear the appropriate personal protective equipment. This includes appropriate eye and face protection.
- PPE requirements vary greatly based on the task being done and individual company policies. If you have any questions about the PPE and clothing required for a certain hot work task, ask your supervisor.
- The operator should review the hot work permit prior to performing work, noting any special precautions.
- Before beginning the task, the operator should become familiar with the work area and know the location of the nearest telephone, fire alarm and fire extinguisher, and know how to use them.
- Other employees should be advised by the operator of conditions pertaining to the job that may affect them.
- When a permit is required, the operator must get approval from the permit authorizing individual before starting any hot work task.
- The operator should post the hot work permit in the work area at a location where affected employees will be able to see it.
- If a fire watch is required, he or she should be consulted about potential hazards by the operator.

During The Operation

- While working, the operator must ensure that the equipment and hot work activities are handled safely.
- Should unsafe conditions develop, the operator must discontinue hot work operations and notify management or the permit authorizing individual.
- The operator must also halt work should an emergency alarm sound and disconnect all electrical equipment and turn off and secure all gas cylinders.

- The operator must constantly be aware of conditions in the immediate work area and within the fire-safe radius established by the permit. The area should be kept in good order, free of ignitable materials and tripping hazards.
- Keeping an orderly work area free of ignitable materials is a safe work practice that also applies to designated hot work areas.

After The Work Is Complete

- The hot work operator should clean up the work site and return all equipment to its appropriate storage area after the completion of each work shift.
- When work is complete, the worker should inspect the work area and adjacent areas to make sure they are safe and any required fire watch must remain for the duration specified on the permit.
- The operator should then notify the permit authorizing individual that the job has been completed so the permit may be closed.

COMMUNICATION WITH OUTSIDE CONTRACTORS

- Many organizations outsource their hot work to contractors who have expertise in specific hot work operations. When this is the case, certain precautions must still be taken.
- Outside contractors typically do not have a full understanding of specific firefighting procedures or combustible hazards within a client's property. For this reason, personnel from the host facility must discuss all safeguards that the contractor should be aware of.
- For example, it should be determined how the contractor will properly isolate the hot work to prevent fire hazards, who will be assigned as the fire watch during the operation and how the contractor should respond in the event of an emergency.
- The contractor should be informed where firefighting equipment is located and told where hot work equipment can be connected to gas or electrical systems.
- The contractor should also be instructed on the facility's non-permissible areas which are those areas where all hot work is prohibited.

SUMMARY

- Performing hot work is an essential part of our production and maintenance operations.
- Hot work has the potential to be hazardous, but its hazards can be controlled by following safe work practices:
 - 1) Working in well-kept designated areas whenever possible;
 - 2) Removing or controlling combustibles when working in non-designated areas;
 - 3) Establishing a proper fire watch when required;
 - 4) Following the requirements outlined in the hot work permit.
- These are all important steps that must be taken to prevent fires while performing hot work.

PREPARE FOR THE SAFETY MEETING

Review each section of this Leader's Guide as well as the program. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the program. Play it without interruption. Review the program content by presenting the information in the program outline.

Copy the review questions included in this Leader's Guide and ask each participant to complete them.

Make an attendance record and have each participant sign the form. Maintain the attendance record and each participant's test paper as written documentation of the training performed.

Here are some suggestions for preparing your video equipment and the room or area you use:

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the program.

CONDUCTING THE PRESENTATION

Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to discuss the safe work practices that should be taken to prevent hot work mishaps and to review the responsibilities of those workers involved in hot work tasks.

Introduce the program. Play it without interruption. Review the program content by presenting the information in the program outline.

Lead discussions about specific precautions that should be taken during hot work operations at your facility that can prevent injuries and property damage.

After watching the program, the viewer will be able to explain the following:

- Topics included in a typical hot work safety program;
- Precautions that must be taken before a hot work operation begins;
- The duties of the permit authorizing individual;
- Responsibilities of the fire watch and the hot work operator;
- The safeguards that should be discussed with outside contractors.

PREVENTING FIRES IN HOT WORK OPERATIONS
Review Quiz

Name _____ Date _____

Please circle the correct answer to show how well you understand the information presented during this program.

1. Some common examples of hot work include welding, cutting, grinding and brazing.
 - a. true
 - b. false

2. Designated work areas should be _____.
 - a. free of combustibles
 - b. have a fire extinguisher
 - c. separated from adjacent work areas
 - d. all of the above

3. When hot work is performed in a designated area, a hot work permit is not required.
 - a. true
 - b. false

4. A hot work permit is required anytime hot work is performed in a non-designated area.
 - a. true
 - b. false

5. The person authorized to issue hot work permits is called the _____.
 - a. Permit Issuer
 - b. Competent Person
 - c. Permit Authorizing Individual

6. Unless otherwise specified by the permit, the radius of the combustible-free zone should be _____.
 - a. 10 feet
 - b. 35 feet
 - c. 50 feet

7. Openings or cracks in walls or floors within 35 feet must be covered to prevent the passage of sparks.
 - a. true
 - b. false

8. Which of the following describes a fire watch?
 - a. a trained and authorized person
 - b. responsible for maintaining a fire-safe condition
 - c. must watch for fires after work is completed
 - d. all of the above

9. The fire watch is only allowed to watch for fires and does not have the authority to stop the hot work operation.
 - a. true
 - b. false

10. The hot not work operator does not need to review the permit before performing the hot work.
 - a. true
 - b. false

ANSWERS TO THE REVIEW QUESTIONS

1. a

2. d

3. a

4. a

5. c

6. b

7. a

8. d

9. b

10. b