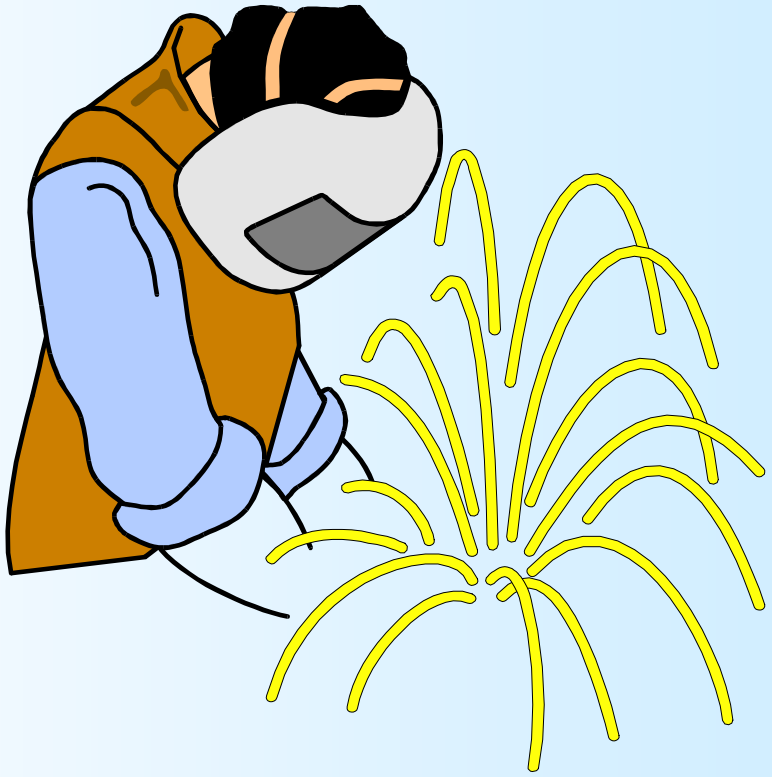
Hot Work Training

Risk Management Department



Agenda

- Importance of fire prevention during Hot Work operations
- Regulatory background
- OSHA’s welding, cutting and brazing standard
- NFPA’s standard for fire prevention during welding, cutting and other hot work
- CCSD written Hot Work Program
- Implementation assistance

Importance of Fire Prevention During Hot Work Operations

Hot Work is any work involving burning, welding or similar operations that are capable of initiating fires or explosions. This program covers the following Hot Work processes:

- **Welding and Allied Processes**
- Heat Treating
- Grinding
- Thawing Pipe
- Powder-Driven Fasteners
- Hot Riveting
- Similar Applications Producing a Spark, Flame or Heat

Importance of Fire Prevention During Hot Work Operations

May, 2001

University of Kentucky

A building that housed the university president and other offices was destroyed by a fire that apparently was started by welding on the roof. The building, which had been constructed in 1882, was undergoing a $1.3 million renovation.

Importance of Fire Prevention During Hot Work Operations

April, 2003

University of Florida

Sparks from welding equipment caused a fire that forced the evacuation of several hundred people at the J. Hillis Miller Science Center. The fire started while a worker was repairing the ventilation system. Two people complained of smoke inhalation and all the research animals were exposed to the smoke.

Importance of Fire Prevention During Hot Work Operations

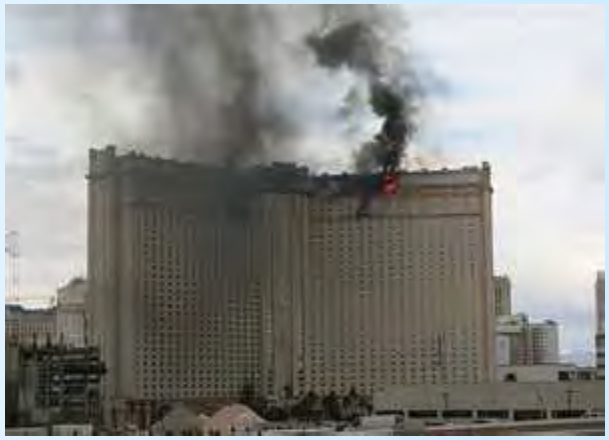
June, 2003

St. John's University

An electrical worker was burned when a fire broke out in the basement of a dormitory. The electrical worker was installing equipment to improve cell-phone reception. Two workers were standing side by side using handheld tools that emitted sparks. Sparks from the tools fell into a bucket containing glue, creating the fire.

Examples of Unsafe Hot Work Practices:

January 25, 2008
Monte Carlo Hotel, Las Vegas
Sparks from torch equipment caused a fire that forced the evacuation of several hundred people.



April, 2003
University of Florida
Sparks from welding equipment caused a fire that forced the evacuation of several hundred people at the J. Hillis Miller Science Center. The fire started while a worker was repairing the ventilation system.

Cooling Tower Fire Caused By:

Unsafe Hot Work Practices Continued :

During welding work at a refinery in Korea, a fire broke out in the cooling tower block of the power supply plant and spread rapidly over the entire complex at an incredible speed.

Regulatory Background

- Occupational Safety and Health Act of 1970
- Occupational Safety and Health Administration (OSHA)
- Public Employees Risk Reduction Program (PERRP) Act of 1994

OSHA's and NFPA's Welding, Cutting and Brazing Standards

- Required basic precautions including:
  - define responsibilities for hot work;
  - protection of personnel;
  - removing, guarding or shielding combustibles;
  - trained and equipped fire watch(es);
  - designated welding areas;
  - authorized written hot work permits and;
  - training and communication.

Clark County School District (CCSD) Written Hot Work Program Introduction

- Policy Statement
- Forward
- Objective
- Applicability

CCSD Written Hot Work Program Introduction

- Responsibilities:
  - Safety and Health Specialist
  - Fire Safety Officer
  - Office of Design and Construction
  - Outside Contractors
  - Management
  - Permit Authorizing Individual (PAI)
  - Fire Watch
  - Supervisors
  - Employees (Hot Work Operators)

CCSD Written Hot Work Program Introduction

- Safety and Health Specialist Responsibilities

  – coordinating the Hot Work Program;
  – assisting departments and areas with training and;
  – updating and evaluating CCSD Hot Work Program.

CCSD Written Hot Work Program Introduction

- Fire Safety Officer Responsibilities
  - assisting in determining the suitability of designated areas for hot work and;
  - performing fire extinguisher training.

CCSD Written Hot Work Program Introduction

- Office of Design and Construction Responsibilities
  - advising contractors about flammable materials or hazardous conditions of which they may not be aware and ensuring that they are familiar with the provisions of NFPA 51B and 29 CFR 1910.252 and;
  - including hot work as an agenda item in the pre-construction meeting, at which time, Risk Management Department representatives will provide a copy of CCSD Hot Work Program and answer questions.

CCSD Written Hot Work Program Introduction

- Outside Contractors Responsibilities
  - following the provisions of NFPA 51B and 29 CFR 1910.252.

CCSD Written Hot Work Program Introduction

- Management Responsibilities
  - providing employees with adequate training including the inherent risks involved, the emergency procedures in the event of a fire, instructions on all equipment and processes, as well as the provisions of this program;
  - recognizing responsibility for the safe usage of cutting and welding equipment on CCSD property and ensuring only approved equipment is used;

CCSD Written Hot Work Program Introduction

- Management Responsibilities cont…
  - designating a permit authorizing individual (PAI);
  - establishing permissible areas for hot work and procedures for cutting and welding in other areas;

CCSD Written Hot Work Program Introduction

- Management Responsibilities cont…
  - advising contractors about flammable materials or hazardous conditions of which they may not be aware and ensuring that they are familiar with the provisions of NFPA 51B and 29 CFR 1910.252 and;
  - providing fire extinguishing equipment.

CCSD Written Hot Work Program Introduction

- Permit Authorizing Individual (PAI) Responsibilities
  - the safe operation of hot work activities;
  - inspecting the area before cutting or welding is permitted, determining site specific hazards and issuing hot work permits;
  - ensuring the protection of combustibles from ignition sources;

CCSD Written Hot Work Program Introduction

- Permit Authorizing Individual (PAI) Responsibilities cont…
  - determining that fire protection and extinguishing equipment is properly located at the site;
  - making sure a fire watch is available at the site and;
  - where a fire watch is not required, making a final check **60** min. after the completion of hot work to detect and extinguish possible smoldering fires.

CCSD Written Hot Work Program Introduction

- Fire Watch Responsibilities
  - being aware of the inherent hazards of the work site and of the hot work;
  - ensure that safe conditions are maintained;
  - have the authority to stop the hot work if unsafe conditions develop;

CCSD Written Hot Work Program Introduction

- Fire Watch Responsibilities cont…
  - having fire extinguishing equipment, as well as attending required training;
  - sounding and being familiar with alarm procedures in the facilities in case of an uncontrolled fire and;
  - watching for fires in all exposed areas, during hot work operations for at least 60 min. after completion and extinguish them only when they are within the scope of their training and equipment.

CCSD Written Hot Work Program Introduction

- Supervisor Responsibilities
  - attending supervisor training offered by Risk Management Department;
  - ensuring all employees who perform hot work are trained on the Hot Work Program and it's requirements;
  - safe handling and use of equipment, as well as determining any combustible or hazardous areas that are present in the Hot Work area;

CCSD Written Hot Work Program Introduction

- Supervisor Responsibilities cont…
  - protecting combustibles from ignition by moving the work to a location free from combustibles, moving combustibles to a safe distance or properly shielding them against ignition;
  - **seeing that Hot Work is not scheduled to be performed during operations that might expose combustibles to ignition;**
  - assuring that Hot Work is not scheduled during operations that might expose combustibles to ignition

CCSD Written Hot Work Program Introduction

- Supervisor Responsibilities cont…
  - obtaining a hot work permit from the PAI and determining that the hot work operator secures his approval that conditions are safe before performing any hot work;
  - ensuring that fire protection and extinguishing equipment are properly located at the site and employees are trained in its use;
  - making a fire watch available if needed;

CCSD Written Hot Work Program Introduction

- Supervisor Responsibilities cont…
  - enforcing CCSD Hot Work Program by ensuring all employees under their direction comply with all facets of the Hot Work Program and;
  - providing a copy of the Hot Work Program to employees upon their request.

CCSD Written Hot Work Program Introduction

- Employee (Hot Work Operators) Responsibilities
  - completely adhering to the requirements of this program and attending required training;
  - understanding the emergency procedures in the event of a fire and shall have an awareness of the inherent risks involved;

CCSD Written Hot Work Program Introduction

- Employee (Hot Work Operators) Responsibilities cont…
  - having the PAI's and supervisor's approval before starting the hot work operations;
  - stopping hot work operations and notifying management, the area supervisor or the PAI if an unsafe condition occurs and;
  - return hot work permits to Supervisor upon completion of hot work operation.

CCSD Written Hot Work Program Introduction

- Program Enforcement
  - A violation of a CCSD employee's responsibility must be reported to the employee's immediate supervisor for appropriate action.

CCSD Written Hot Work Program Welding Areas

- Designated areas
  - a designated fire resistant area or areas made of noncombustible construction.
- Permit required areas
  - an area that requires a written hot work permit and shall be made safe by removing or protecting combustibles from ignition sources.

CCSD Written Hot Work Program Welding Areas

- Non-permissible welding areas
  - areas not authorized by management;
  - sprinklered buildings while such protection is impaired;
  - in the presence of an explosive atmosphere, including improperly prepared drums that once contained flammable materials and;
  - areas near storage of large quantities of exposed, readily ignitable materials.

CCSD Written Hot Work Program Welding Areas

- Hot work shall not be attempted on
  - a partition, wall, ceiling or roof that has a combustible covering or insulation or on walls or partitions of combustible sandwich-type panel construction and;
  - pipes or other metal that is in contact with combustible walls, partitions, ceilings or roofs shall not be done if the work is close enough to cause ignition by conduction.

CCSD Written Hot Work Program

Fire Watch

- Required when
  - hot work is performed in an area where other than minor fires might develop;
  - combustible materials in building construction or contents are closer than 35 ft (11m) to the point of operation;
  - combustible materials are more than 35 ft (11m) away, but are easily ignited by sparks;

CCSD Written Hot Work Program

Fire Watch

- Required when
  - wall or floor openings within a 35 ft (11m) radius expose combustible materials in adjacent areas, including concealed spaces in walls or floors or;
  - combustible materials are adjacent to the opposite side of partitions, walls, ceilings or roofs and are likely to be ignited.

CCSD Written Hot Work Program

Fire Watch

- A fire watch must be maintained for 60 min. after completion of hot work.
- More than one fire watch is required when combustible material that could be ignited by hot work cannot be directly observed by only one fire watch.

CCSD Written Hot Work Program
Hot Work Permit

- A hot work permit
  - must be obtained from the PAI for hot work being performed in permit required areas;
  - the PAI must verify that the precautions on the permit have been completed before authorizing work and at least once per day during the operation;
  - The permit must be displayed at the job site;

CCSD Written Hot Work Program
Hot Work Permit

- A hot work permit
  - must be removed and given to the supervisor upon completion of hot work operation.
  - Can be issued for no more than 4 days if the job performed is the same and is located on the same floor/area;

CCSD Written Hot Work Program
Hot Work Permit

- Located in Appendix A is the CCSD Hot Work Permit.
- Located in Appendix B is the CCSD Fire Watch Decision Tree.

CCSD Written Hot Work Program Training

- Hot Work$_1$ training session -This Session

- Hot Work$_2$ training session
  - the inherent risks involved;
  - the emergency procedures in the event of a fire;
  - instructions on all equipment and processes and;
  - the provisions of this program.

CCSD Written Hot Work Program Other Precautions

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

CCSD Written Hot Work Program Other Precautions

- Confined Spaces cont…
  - In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off at some point outside the confined space area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. When practical, the torch and hose shall also be removed from the confined space.

CCSD Written Hot Work Program Other Precautions

- Confined Spaces cont…
  - When welding or cutting is being performed in any confined space, the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

CCSD Written Hot Work Program Other Precautions

- Personal Protection
  - Must be identified through CCSD PPE program.
- The following must be practiced for fall protection
  - A welder working on platforms, scaffolds or runways shall be protected against falling; by the use of railings, life lines or some other equally effective means.
  - Welders shall also place welding cables and other equipment so that they are clear of passageways, ladders and stairways.

CCSD Written Hot Work Program Appendicies

- A – Hot Work Permit
- B – Oxygen-Fuel Gas Welding and Cutting
- C – Arc Welding and Cutting
- D – Resistance Welding

Risk Management Department Implementation Assistance

- The Risk Management Department will assist departments with:
  - hot work permit training;
  - fire extinguisher training and in;
  - determining the suitability of designated hot work areas.
- Contact Risk Management at 799-6496 for a department consultation.

Summary

- Importance of fire prevention during hot work operations
- Regulatory background
- OSHA's welding, cutting and brazing standard
- NFPA's standard for fire prevention during welding, cutting and other hot work
- CCSD written Hot Work Permit Program
- Implementation assistance

Where to Get More Information

- http://www.osha.gov. Occupational Safety and Health Administration.
- http://riskmanagement.ccsd.net

Appendix A

CCSD Hot Work Permit

BEFORE INITIATING HOT WORK, ENSURE PRECAUTIONS ARE IN PLACE!
MAKE SURE AN APPROPRIATE FIRE EXTINGUISHER IS READILY AVAILABLE!

This Hot Work Permit is required for any operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch-Applied Roofing, and welding.

INSTRUCTIONS

A. Verify precautions listed at right (or do not proceed with the work).
B. Completed permit maintained on site while operation is being performed.
C. Return permit to supervisor when complete.

HOT WORK BEING DONE BY ☐ EMPLOYEE ☐ CONTRACTOR _____		
DATE	JOB NO.	
LOCATION/BUILDING & FLOOR		
NATURE OF JOB/OBJECT		
NAME OF PERSON DOING HOT WORK		
I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for work.		
SIGNED: (Permit Authorized Individual)		
PERMIT EXPIRES:	DATE	TIME
IN THE EVENT OF A FIRE, IMMEDIATELY DIAL 911 AND REPORT THE SITUATION.		

Required Precautions Checklist

☐ Available sprinklers, hose streams, and extinguishers are in service/operable.
☐ Hot work equipment in good repair.

Requirements within 35 ft of work

☐ Flammable liquids, dust, lint, and oil deposits removed.
☐ Explosive atmosphere in area eliminated.
☐ Floors swept clean.
☐ Combustible floors wet down, covered with damp sand or fire-resistant sheets.
☐ Remove other combustibles where possible. Otherwise protect with fire-resistant tarpaulins or metal shields.
☐ All wall and floor openings covered.
☐ Fire-resistant tarpaulins suspended beneath work.

Work on walls or ceilings/enclosed equipment

☐ Construction is noncombustible and without combustible covering or insulation.
☐ Combustibles on other side of walls moved away.
☐ Enclosed equipment cleaned of all combustibles.
☐ Containers purged of flammable liquids/vapors.

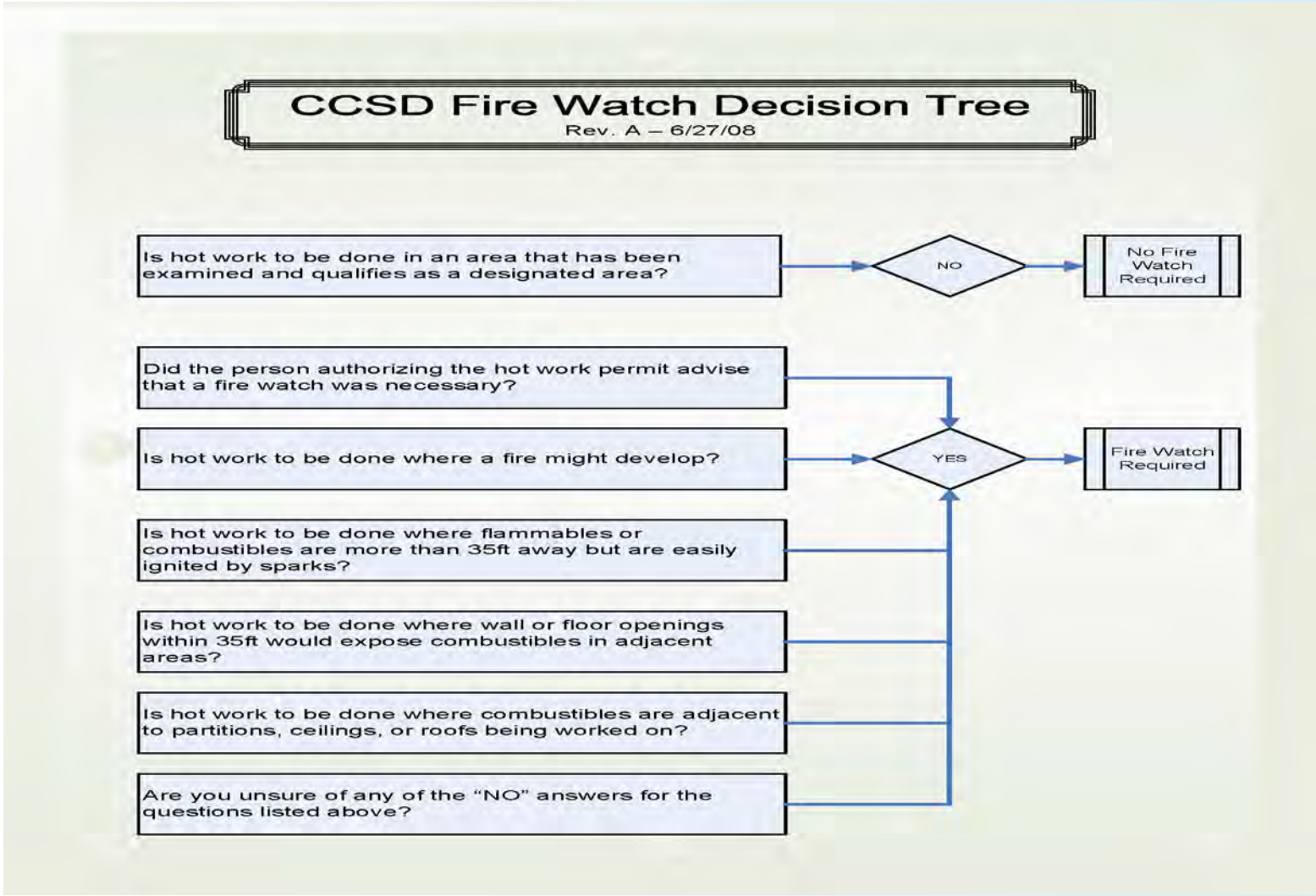
Fire watch/hot work area monitoring

☐ Fire watch will be provided during and for 60 minutes after work, to include any coffee or lunch breaks.
☐ Fire watch is supplied with suitable extinguishers.
☐ Fire watch is trained in use of this equipment and in sounding alarm.
☐ Fire watch may be required for adjoining areas, above, and below area of operation.
☐ Monitor hot work area for 4 hours after job is completed. Check area every 30-60 minutes.

Other precautions taken where identified

☐ Confined space entry permit required.
☐ Area protected with smoke or heat detection.
☐ Ample ventilation to remove smoke/vapor from work area.
☐ Lockout/tagout required.

Appendix B


CCSD Fire Watch Decision Tree
Rev. A – 6/27/08
Is hot work to be done in an area that has been examined and qualifies as a designated area?
NO
No Fire Watch Required
Did the person authorizing the hot work permit advise that a fire watch was necessary?
Is hot work to be done where a fire might develop?
YES
Fire Watch Required
Is hot work to be done where flammables or combustibles are more than 35ft away but are easily ignited by sparks?
Is hot work to be done where wall or floor openings within 35ft would expose combustibles in adjacent areas?
Is hot work to be done where combustibles are adjacent to partitions, ceilings, or roofs being worked on?
Are you unsure of any of the "NO" answers for the questions listed above?