Course Overview

• Jobsite Fire Prevention
  – Module will familiarize you:
    • With the basics of how to recognize construction-related fire hazards.
    • To plan an emergency response.
    • To know the equipment necessary to protect life, the environment, and property.
Course Overview

• Course Description
  – This course will review:
    • Common fire hazards on construction and construction related projects.
    • The importance of fire control equipment and fire control strategies.
    • Estimated length of this course is 60 minutes
    • References: Various sections of OSHA regulations found in 29 CFR Part 1910. and Part 1926 and those adopted by federal OSHA approved state OSHA plans.

Course Overview

- Course Objectives
- Upon completion, you will be able to:
  - 1: Identify major hazards and causes of fires
  - 2: Describe types of fire hazards and prevention methods
  - 3: Protect themselves from fire hazards thru prevention and emergency response
  - 4: Recognize employer requirements to protect workers from exposure to fires and to ensure adequate prevention and protection is available
Introduction

• What is Construction Work?
  • OSHA’s definition of construction work:
    – "Construction work" means work for construction, alteration, and/or repair, including painting and decorating.
    – Cal OSHA definition includes construction maintenance, renovation, removal, wrecking of any fixed structure. Work in excavations is also included.
Introduction

• Training Useful to All Work
• General information applicable to all industries.
  – Information presented is useful to general industry and other non construction operations.
  – Regulations may differ somewhat.
  – Ultimate goal is Fire Prevention through fire hazard awareness, recognition, evaluation, and control.
Introduction

• This module:
  – Does not cover every possible fire hazard nor how to become a firefighter.
  – Does cover basic understanding of how to recognize typical fire hazards and review methods of control.
  – Critically important to evaluate, analyze, control fire risks at beginning and throughout project.

Introduction

• Potential for Major Loss of Life and Property.

• According to National Safety Council:

  – Losses due to workplace fires:
    • Hundreds of workplace deaths (327 in a recent year).
    • 3.3 % of occupational fatalities.
    • $2.1 billion in losses.
Introduction

• Fire Tragedies
• Long and tragic history of workplace fires.
  – Triangle Shirtwaist Factory in New York City in 1911.
  – Nearly 150 women and young girls died because of locked fire exits and inadequate fire extinguishing systems.
• What do you think were the major issues contributing to the high death count?
  – Arson [wrong]
  – Match or cigarette butt [correct]
  – Locked exit doors [correct]
  – No alarm system [correct]
  – Flimsy fire escape [correct]
Introduction

• History Repeats Itself
• Hamlet, North Carolina fire:
  – Fire in a poultry processing plant.
  – Out of 90 employees on the shift, 25 died, 54 were injured.
  – Loss of 200 jobs.
  – Owner ordered that doors locked to prevent alleged theft.
  – Owner found guilty of involuntary manslaughte, sentenced to 19 years in prison.
• What did this disaster have in common with the Triangle fire?
  – Arson [buzz]
  – No fire escape [buzz]
  – Locked exit doors [ding]
Introduction

• In the Hamlet Fire
• Multiple fire safety violations uncovered.
  – Locked doors.
  – No marking of exits or non-exits.
  – Excessive travel distances to exits.
  – No fire alarms.
  – Obstructed doors.
  – No emergency action plan or fire prevention plan.
  – No automatic fire suppression plan.
Job Site Hazards and Controls

- Fire Hazards Recognition: First Step
- Eyes open to recognize fire hazards
  - Some hazards may be obvious, others take a trained eye.
  - Each job site has specific hazards.
  - Evaluate by qualified and/or competent person before work begins and frequently during project.
  - Maintaining a hazard free job site is everyone’s responsibility.
**Job Site Hazards and Controls**

- **Hot Work: Definitions**
  - Any work with potential for ignition:
    - 1. Welding
    - 2. Grinding
    - 3. Soldering
    - 4. Flame cutting
    - 5. Brazing
    - 6. Space heaters
    - 7. Other known ignition sources
Job Site Hazards and Controls

- **Dangers of Hot Work**
- **Inspection results:**
  - OSHA conducted an inspection.
  - OSHA issued three citations, one willful, one serious and one repeat.
  - Had the violations of the standards not existed, fatality may not have happened and worker might still be alive.
- **OSHA accident prevention recommendations:**
  - Use nitrogen instead of oxygen. [wrong]
  - Do not use oxygen for ventilation, cooling or cleaning in welding. [correct]
  - Provide fall protection in case of unconscious. [correct]
  - Follow confined spaces requirements as specified in OSHA requirements as a minimum. [correct]
  - Train employees to recognize and avoid unsafe conditions and to understand the confined space program and follow its procedures. [correct]
OSHA Hot Work Requirements

- OSHA has adopted hot work regulations.
  - 29 CFR 1926.352
  - Address location of work, fire extinguishing equipment, safe work practices, additional personnel to guard against fire, enclosed spaces, specialty work relative to drums, containers, hollow structures.
  - Become familiar with requirements and follow them.
Job Site Hazards and Controls

- OSHA Hot Work Requirements
- Hot work location.
  - Objects to be welded, cut, or heated must be moved to a designated safe location.
  - If not practicable, take all movable fire hazards to a safe place or protect them against heat, sparks, and slag.
  - What hazards do you see in the photo? Use your mouse to identify.
Job Site Hazards and Controls

- OSHA Hot Work Requirements
- Work near flammables and fire extinguishers.
  - No welding, cutting, or heating where application of flammable paints, presence of flammable compounds, or heavy dust concentrations creates a hazard.
  - Suitable fire extinguishing equipment immediately available and maintained in a state of readiness for instant use.
Job Site Hazards and Controls

• OSHA Hot Work Requirements
• Secondary Hot Work safeguards.
  – When fire hazards can’t be removed:
    • Use welding blankets.
    • Use water hose to wet down area.

Safety Tip: Plan ahead and discuss all options and appropriate fire prevention measures.
Job Site Hazards and Controls

- OSHA Hot Work Requirements
- Precautions in adjacent areas:
  - Precautions must be taken when welding, cutting, or heating performed on walls, floors, and ceilings, since direct penetration of sparks or heat transfer may introduce a fire hazard to adjacent area.
Job Site Hazards and Controls

• Hot work: Fire Watch
• Fire Watch assigned:
  – When fire prevention may not be sufficient, assign a trained fire watch.
  – Fire watch must stay for a sufficient period of time after completion of work to ensure no possibility of fire exists.

Safety Tip: Many hot work related fires start well after the completion of work due to latent heat, smoldering materials, etc.
• Hot work: Fire watch
  – A qualified fire watch should:
    • Monitor surrounding area.
    • Excess sparks requires more than one fire watch!
    • Remember! Most large fires start as small fires.
    • Fire extinguisher in close proximity for immediate use.
Job Site Hazards and Controls

• Fire Watch Job and Training
  – Fire watch to check hot work area is free from flammables and combustibles before work begins.
  – Must be trained:
    • Hazard recognition
    • Basic fire fighting
    • Extinguisher use
    • Reporting/notification procedures
Job Site Hazards and Controls

• Hot Work, Flammable Liquids

• Flammable liquid containers:
  – Drums, pails, containers which contain or have contained flammable liquids kept closed except when contents being removed or transferred.
  – Empty containers removed to a safe area apart from hot work operations or open flames.
Job Site Hazards and Controls

- Hot Work, Drums and Containers
- Drums, containers, hollow structures:
  - Which have contained toxic or flammable substances before hot work on them, filled with water or thoroughly cleaned of such substances, ventilated and tested.
  - Vent or opening provided to release any built up pressure.
Case Study: Welder Fatality

Fatal Facts #53:

– Explosion leaves one 26 year old welder dead.
  – On a clear day, crew of two working on project for 15 minutes when there was a violent explosion and fire.
  – A review revealed that two employees were welding brackets onto a 55,000 gallon oil storage tank.
Job Site Hazards and Controls

• Case Study: Welder Fatality
• OSHA cites four standards:
  – Train employees to recognize, avoid unsafe conditions. [correct]
  – The requirement to have a sprinkler running in the area. [wrong]
  – Use of appropriate PPE. [correct]
  – No hot work where exposure to hazardous substances. [correct]
  – Drums, containers, which contain or have contained hazardous substances must be filled with water or cleaned, ventilated, tested before hot work. [correct]
Job Site Hazards and Controls

• Case Study: Welder Fatality
• Additional recommendations. Do you think any of these could have been made?
  – Failure to notify the authorities in advance. [wrong]
  – Failure to provide a pressure release vent or hole. [correct]
  – Failure to apply insulating material to the tank. [wrong]
Job Site Hazards and Controls

- Hot Work: Enclosed Spaces
- OSHA requires:
  - Shut off gas gas supply to heating torches outside of enclosed space whenever torch not used or unattended.
  - Remove torch and hose from enclosed spaces at change of shift and overnight.
  - Immediately remove open end fuel gas and oxygen hoses from enclosed spaces when disconnected from the torch or other gas-consuming device.
Job Site Hazards and Controls

- Hot Work in Enclosed Space
- Fatal Facts #72
- Background:
  - 45 year old male, 20 years experience killed in explosion.
  - Iron worker on job 2 hours when explosion occurred.
  - Crew included fatally injured worker, one other employee.
Job Site Hazards and Controls

- Hot Work in Enclosed Space
- Fatal Facts #72
- OSHA fatality investigation.
  - Can you identify the two serious violations?
    - Take precautions to provide sufficient ventilation. [correct]
    - Ensure portable heaters and blow torches equipped with automatic shut off devices. [correct]
    - Always pack the torch in dry ice to avoid overheating. [wrong]
Job Site Hazards and Controls

• Cut Off Saws
  – Often overlooked.
  – Workers surrounded by oil soaked formply or other combustible debris.
  – Fire extinguisher immediately available and a fire watch posted.
Job Site Hazards and Controls

• Cut Off Saws
  – Case study - recent burn incident:
    • Carpenter refilled saw with fuel.
    • Didn’t replace fuel filler cap.
Job Site Hazards and Controls

• Cut Off Saws
  – Case study - recent burn incident:
  – Based on your review of the case, what precautions do you think should have been taken?
    • Ensure that equipment is in good repair and used properly. Failure to replace the filler cap was a critical mistake. [correct]
    • Notify OSHA when doing this type of work. [wrong]
    • Ensure that workers are properly trained in the jobs they must do. [correct]
    • Always be sure to have a fire extinguisher close by when using cutoff saws or other gasoline powered equipment. [correct]
    • Conduct a hazard analysis for all tasks. [correct]
Job Site Hazards and Controls

• Hot Work Permit

• A good safety checklist.
  – Can minimize the risk of fire during hot work.
  – Serves as a checklist for operators, fire watch.
  – Person issuing qualified to examine work site and check appropriate protective safety controls taken.
  – Issued at beginning of each shift for each specific operation.
More Job Site Hazards and Controls

- Temporary Electrical Equipment
- Electrical fires common.
  - Electrical installations and repairs performed by qualified person.
  - Conductors not rest on floors and protected from damage.
  - Power lines and cords sufficient to carry the necessary current, equipped with over current protection.
  - Electrical outlets near work area to prevent overloaded extension and/or flexible cords.
More Job Site Hazards and Controls

- Temporary Heating
- Safe practices.
  - All temporary heating equipment provided with proper clearances from flammable and combustible materials and adequate ventilation.
  - Temporary enclosures made with flame resistant materials of low combustibility.
More Job Site Hazards and Controls

- Flammable / Combustibles
- Leading Cause of Job-Site Fires
  - Easily ignited when exposed to ignition source:
    - Gasoline
    - Paint thinners
    - Solvents
    - Natural gas
    - Acetylene
More Job Site Hazards and Controls

• Flammable / Combustibles

• Combustible materials:
  – Readily catches fire when exposed to heat or ignition source.
    • Paper
    • Rag
    • Trash
    • Plastics
    • Cardboard
    • Rubber
More Job Site Hazards and Controls

- Flammable / Combustibles
- Storage / use:
  - Never store near ignition source.
  - OSHA specifies flammable liquids may be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.
  - Inspect the work area in a 3 dimensional view (horizontally, vertically)
  - Capture the “big picture.”
More Job Site Hazards and Controls

- **Flammable / Combustibles**
- **Safe practices:**
  - Know which chemicals can be stored together and which ones can’t.
  - Check MSDSs for storage compatibility information.
  - Ensure containers labeled with chemical or common name, hazard warning statement, manufacturers contact information.
  - Keep lids or covers on containers when not in use.
  - Use secondary containment.
  - Fire-suppression system available.
More Job Site Hazards and Controls

- Chemical Storage
- Know dangers and properties.
  - Dangers of Improper Storage:
    - Chemical Fire
    - Toxic Release
More Job Site Hazards and Controls

• Chemical Storage

• Storage don’ts
  – Never store:
    • Flammable chemicals with oxidizers/corrosives. Can react violently resulting in fire or explosion.
    • Acids and bases (caustics) in the same area. Can generate heat and react violently.
    • See any hazards in the photo? Use your mouse to identify.

Poor housekeeping in work area, numerous potential trip and fire hazards. Area should be cleaned up before soldering pipe joints. Acetylene bottle left standing, unsecured and unattended with valve open. Is there a fire extinguisher readily available in case of a fire?
More Job Site Hazards and Controls

- Chemical Storage
- Storage DOs:
  - Always store chemicals:
    - Away from occupied buildings
    - Away from the public
    - Out of the sun
    - Inside a secondary containment area
More Job Site Hazards and Controls

• Chemical Storage

• Storage area planning:
  – Plan should address:
    • Proximity to buildings, public, break areas
    • Response Access
    • Number, size, class ratings of Fire Extinguishers
    • Type/Quantity of chemicals in area

Safety Tip
Signs warning of the hazards present should be posted around the storage area.
More Job Site Hazards and Controls

• Chemical Storage

• In addition:
  – Know on-site chemicals and their properties;
    • Read labels and MSDSs.
  – If chemical is not labeled or no MSDS?
    • Do Not let on-site
More Job Site Hazards and Controls

- Compressed Gas Cylinders

- Storage: safe practices:
  - Oxygen and fuel gas cylinders in storage separated by minimum distance of 20 feet or by a 5 foot high barrier of rated noncombustible materials.
  - Valve protection caps secured over cylinder valves.
  - LP gas is flammable, never be stored inside a building.
More Job Site Hazards and Controls

• Compressed Gas Cylinders

• Special considerations: training and use.
  – Oil and grease in presence of pure oxygen can burn violently if ignited. Never use oil or grease on oxygen cylinder valves, regulators or other parts.
  – Compressed gas cylinders because of potential for flammability, explosability, and pressure hazards must only be handled by trained, qualified and authorized personnel.
More Job Site Hazards and Controls

- Housekeeping

- Major contributing factor in fire.
  - Poor housekeeping is a major contributing factor in many construction, industrial, commercial and residential fires.
  - Why? A small easily confined and controlled fire can quickly become an inferno when it spreads to piles of scrap, debris, or other waste materials.
More Job Site Hazards and Controls

• Housekeeping
  – Fire Loading:
    • Amount of combustible material in building.
    • High fire loading is dangerous.
    • Don’t leave excess combustible materials about.
• Housekeeping
• Continuous considerations.
  – Police your work area daily.
  – “Clean as you go” = build good housekeeping into job.
  – Remove materials that increase the fire potential.
  – All waste piles or dumpsters located in area clear from ignition source.
  – Special consideration given to elevated welding or cutting.
More Job Site Hazards and Controls

- Smoking
- "SMOKING AREA"
  - Smoking in designated areas only.
  - Prohibited in areas with fire risks:
    - Chemical and fuel storage, dispensing and use.
    - Woodworking
    - Foam plastic areas.
    - Significant concentrations of paint, solvent, or adhesive vapors.
More Job Site Hazards and Controls

- Flammable / Combustibles
- BLEVE
  - Boiling liquid expanding vapor explosion or BLEVE for short.
  - This can occur when containers of flammable gas are exposed to intense flame or heat.
  - If you ever encounter flammable liquid containers engulfed in flame, get away immediately and let fire professionals handle the situation.
Emergency Response Plan

• Hazard Recognition and Response
  – Fire Control Team:
    • Typically managers, superintendents, foremen, other key personnel
    • Responsible for identifying and correcting unsafe conditions or have potential to create a fire hazard.
Emergency Response Plan

• Fire Preparedness
• Preparation and planning.
  – Emergencies can occur anytime.
  – Being prepared can reduce seriousness of injuries, damage, and harm to the job site (i.e. stand-downs, project delays).
  – Time taken to prepare a response plan, hazard recognition and control, develop response team, drill emergencies.
Emergency Response Plan

• Fire Preparedness

• Emergency response plan should include:
  – Elements of strategy and tactics designed for safe emergency response.
  – Chemical spills, compressed gas releases, electrical exposures, injuries, structural failures, natural disasters.
  – Initial response pre-planned, easily initiated by the response team.
• Plan Contents
  – Plan should include:
    • Names of team members
    • Notification procedures/contact numbers
    • Roles/duties of each member
    • Critical equipment shut down procedures
    • Guidelines for action
    • Communication equipment/ channels to be used
    • Maps to local hospitals & clinics
    • Emergency contact names & numbers of emergency response contractors
• Emergency Team Roles
  – First responders:
    • Unless your job site has a professionally trained emergency response team, the roles of each member must be carefully thought out. Most team members should be trained as a first responder to each incident listed in the response plan. This means that they should have the knowledge and skills to safely initiate a initial response.
Emergency Response Plan

• Emergency Team Roles
  – Initial response includes:
    • First aid treatment
    • Emergency notifications
    • Evacuation procedures
    • Fire Fighting if trained and safe to do so
    • Chemical leak training
    • Traffic control
    • Working with emergency response agencies
Emergency Response Plan

• Response Agencies
  – Build a relationship with:
    • Police/fire departments/ERTs
    • Hospitals
    • Ambulance companies
    • Local medical clinics
    • Professional rescue companies

Safety Tip: Invite local response agencies to visit your site. They can help identify hazards and offer basic guidance in developing your response plan for the site. Fire departments will evaluate access/egress routes and plan to bring only equipment that can safely maneuver on your work site.
Emergency Response Plan

• Recognizing Hazards
  – Response Team must:
    • Identify unsafe conditions.
    • Put controls into place for hazards on site.
Response Equipment

• Federal Requirements
  – OSHA requires employer to provide:
    • Development of Fire Protection Program.
    • On-site fire fighting equipment.
    • Training for equipment use.
    • Access to equipment at all times.
Response Equipment

• Equipment Requirements
  – Equipment must be:
    • Highly-visible.
    • Easily accessible.
    • Tagged and removed if defective.
    • Kept with readable certification tags.
Response Equipment

• Water Supply
  – Must have sufficient:
    • Volume
    • Duration
    • Pressure
Emergency Response Plan

• Plan Contents
  – Plan should include:
    • Names of team members [correct]
    • Notification procedures/contact numbers [correct]
    • Roles/duties of each member [correct]
    • REI survival guides [wrong]
    • Critical equipment shut down procedures [correct]
    • Guidelines for the next week’s work [wrong]
    • Communication equipment/ channels to be used [correct]
    • Maps to local hospitals & clinics [correct]
    • Emergency contact names & numbers of emergency response contractors [correct]
Response Equipment

• Portable Fire Extinguishers
• PFEs
  – Portable fire extinguishers are also known as PFEs.
  – Often first line of defense in combating onset of a fire.
  – Classified by the types of combustibles and extinguishing media.
  – Five general classifications of fires.
  – Classes: A, B, C, D, K.

Safety Tip
If you have the slightest doubt about your ability to fight a fire....EVACUATE IMMEDIATELY and call for help!
Response Equipment

• Portable Fire Extinguishers

• PFE nameplate offers valuable information.
  – PFEs labeled with pictograph and/or letter of alphabet for class or classes of fire each device is designed to fight.
  – More information found on label: how to operate, weight, rated capacity.
Response Equipment

• Classes of Portable Fire Extinguishers
• Class A PFE designed to fight Class A fires:
  – Class A fires involve “ordinary combustibles” (i.e. wood, paper, cardboard and many plastics).

  – Extinguishing media in Type A PFEs include: water, multi purpose dry chemical, halogenated agents, and foam (for liquids).
Response Equipment

• Classes of Portable Fire Extinguishers
  • Class B designed to fight Class B fires.
    – Class B fires involve “combustible and flammable chemicals” (i.e. flammable liquids and gases, gasoline, fuel oil, propane, butane).
    
    – Extinguishing media in Type B PFEs include carbon dioxide, multi purpose dry chemical, halogenated agents, foam (for liquids only).
Response Equipment

• Classes of Portable Fire Extinguishers

• Class C PFEs designed to fight Class C fires.
  – Class C fires: “energized electrical equipment” (computers, motors, appliances, circuit breaker boxes, etc.).
  – Extinguishing media in Type C PFEs include carbon dioxide, multipurpose dry chemical, halogenated agents.

Safety Tip: Water must never be used on a Class C fire.
Response Equipment

• Classes of Portable Fire Extinguishers

• Class D PFEs designed to fight Class D fires.
  – Class D fires involve “combustible metals” (metal substances such as: magnesium, lithium, sodium, phosphorus, etc.).
  – Extinguishing media in Type D PFEs include dry powder agents (potassium and sodium) approved for use on the specific combustible metal hazard.
Response Equipment

• Classes of Portable Fire Extinguishers
• Class K PFEs designed to fight Class K fires.
  – Class K fires involve “Liquid Cooking Media Fires” (i.e. combustible cooking vegetable or animal oils or fats).
  – Extinguishing media in Type K fire extinguishers include: specific wet and dry chemical agents.
Response Equipment

• Fire Extinguishers
  – Extinguishers must be sized and rated:
    • 5 lb. Model is often too small to adequately fight a job-site fire.
    • 20-30 lb. Fire Extinguisher is better choice.
Response Equipment

• Fire Extinguishers

• Operation of PFEs:
  – For PFEs to be effective, learn how to use them.
  – OSHA requires where PFEs provided for employee use, employer provide training on general principles of PFE use and hazards with incipient stage fire fighting.
  – Before you use a PFE to fight a fire, sound alarm and report fire.
Response Equipment

- Fire Extinguishers
- Check extinguishers
  - Check before use:
    - Verify pressure
    - Verify seal intact
    - Rated for the potential hazard
Response Equipment

• PFE Use
• Size up the fire.
  – If you use PFE, size up fire and approach cautiously.
  – If fire too large, spreading rapidly, or conditions present that make fighting fire hazardous, evacuate and let trained firefighters handle.
  – Always leave an escape route.
  – Stay between exit and fire.
  – Do not get trapped.
Response Equipment

• PFE Use

• Remember the PASS-word:
  – PFE use procedure when fighting a fire.
  – PASS stands for PULL, AIM, SQUEEZE, SWEEP.
  – Stand 6 to 8 feet away from fire, follow four-step PASS procedure.
  – If fire does not begin to go out immediately, leave area at once.
  – Be sure fire department inspects fire site.
Response Equipment

• PFE Use

• Lets look at the PASS-word more closely.
  – P stands for pull.
  – PULL the pin:
  – Pulling pin unlocks operating lever and allows you to discharge extinguisher. Some extinguishers have other devices that prevent inadvertent operation.
Response Equipment

- PFE Use
- A = Aim
  - AIM low.
  - Point extinguisher nozzle (or hose) at base of fire.
• PFE Use

• S = Squeeze
  – SQUEEZE lever below handle:
  – This discharges extinguishing agent.
  – Releasing lever will stop discharge.
  – Some extinguishers have a button that you press.
Response Equipment

• PFE Use

• S = Sweep:
  – SWEEP from side to side:
  – Moving carefully toward fire, keep extinguisher aimed at base of fire and sweep back and forth until flames appear to be out.
  – Watch fire area.
  – If fire re-ignites, repeat process and be prepared to evacuate.
Response Equipment

• **PFE Use**

• **Putting PASS all together.**

  **Pull**
  
  PULL the pin:
  
  Pulling pin unlocks operating lever and allows you to discharge extinguisher. Some extinguishers have other devices that prevent inadvertent operation.

  **Aim**
  
  AIM low.
  
  Point extinguisher nozzle (or hose) at base of fire.

  **Squeeze**
  
  SQUEEZE lever below handle:
  
  This discharges extinguishing agent.
  
  Releasing lever will stop discharge.
  
  Some extinguishers have a button that you press.

  **Sweep**
  
  SWEEP from side to side:
  
  Moving carefully toward fire, keep extinguisher aimed at base of fire and sweep back and forth until flame appears to be out.
  
  Watch fire area.
  
  If fire re-ignites, repeat process and be prepared to evacuate.
Response Equipment

• PFE Use

• Before you begin to fight a fire:
  – Make sure everyone has left, or is leaving building.
  – Make sure fire department has been notified.
  – Make sure fire is confined to a small area and not spreading.
  – Make sure you have unobstructed escape route.
  – Make sure you have read instructions, know how to use PFE.
  – If the above conditions are not met, leave immediately and close off area.
• Classes of Portable Fire Extinguishers

Class A PFE
Designed to fight Class A fires:
- Class A fires involve “ordinary combustibles” (i.e. wood, paper, cardboard and many plastics).
- Extinguishing media in Type A PFEs include: water, multi purpose dry chemical, halogenated agents, and foam (for liquids).

Class B
Designed to fight Class B fires.
- Class B fires involve “combustible and flammable chemicals” (i.e. flammable liquids and gases, gasoline, fuel oil, propane, butane).
- Extinguishing media in Type B PFEs include carbon dioxide, multi purpose dry chemical, halogenated agents, foam (for liquids only).

Class C
Designed to fight Class C fires.
- Class C fires are those involving “energized electrical equipment”. Class C fires often include: computers, motors, appliances, circuit breaker boxes and similar.
- The type of extinguishing media found in Type C fire extinguishers include: Carbon dioxide, multipurpose dry chemical, and halogenated agents.
- Water must never be used on a Class C fire.

Class D
Class D fires are those involving “combustible metals”. These include metal substances such as: magnesium, lithium, sodium, phosphorus and more.
- The type of extinguishing media found in Type D fire extinguishers include: dry powder agents (i.e. potassium and sodium) approved for use on the specific combustible metal hazard.

Class K
Class K fires are those involving “Liquid Cooking Media Fires”. These include substances such as: combustible cooking vegetable or animal oils or fats.
- The type of extinguishing media found in Type K fire extinguishers include: specific wet and dry chemical agents.
Response Equipment

- PFE Use
- Case study, have PFE
- and know how to use.
  - Important to know how to use PFE, when to use PFE, and right type.
  - In a recent fire, City firefighters called to extinguish kitchen fire.
  - Fire Department able to save home from significant damage and no loss of life although stove and cabinets a total loss.
Response Equipment

• PFE Use

• Case study, background:
  – Firefighters responded to call just before 7 p.m. as several callers told 911 dispatcher that house was fully involved in flames.
  – When first engine arrived within four minutes, flames seen coming from kitchen.
  – Residents told fire officials that when oil in pan caught fire they threw water, then flour on it.
PFE Use

Was water and flour on the fire a safe approach?

- Select the correct answer:
  - Using water, then flour on fire was a safe approach. [Wrong]
  - Fire did not go out because, not enough water or flour was used. [Wrong]
  - Residents should not have been cooking. [Wrong]
  - Use of water and flour actually made fire worse. [Correct]
Response Equipment

- PFE Use
- Case study, water and flour made fire worse.
  - Water and flour never used on oil fire. Flour will burn, water will splash then vaporize.
  - "This fire could have been worse," fire officials said, if neighbors had not initially used a PFE to slow fire.
  - Residents left all doors open which gave fire oxygen to spread.
  - If you leave, leave immediately and close off area.
Response Equipment

- **PFE Use**
  - On the site, OSHA requires:
    - One extinguisher for each 3,000 sq. ft.
    - Rated not less than 2A.
    - Centrally located: 100’ or less at every point.
    - At least one extinguisher adjacent to stairways.
    - 55 gallon water drum & two round bottom pails substitute.
Response Equipment

• PFE Use

• After use, PFEs must be:
  • Recharged.
  • Recertified by licensed facility.
Response Equipment

• Water Hoses
  – May substitute for 2A rated extinguisher.
    • No longer than 100 ft.
    • 1/2” hose must discharge 5 gallons per minute min.
    • 30 feet horizontally.
    • Mounted on racks/reels.
    • Mounted so stream can reach all points in area.
Response Equipment

• PFEs and Flammable Storage Areas
  – Fire extinguisher must be:
    • Rated not less than 10B.
    • Within 50’ of 5 gallons or more of flammable liquids.
    • Within 50’ of 5 lbs. Or more flammable gas.
    • Note: vehicle fuel tanks in area of hot work!
Response Equipment

• Equipment Compatibility
  – Specs differ!
    • Sizes, styles, threads, fittings may not be compatible.
    • Law requires contractor to provide adapters to connect fire water supplies at your site.
Response Equipment

• Demolition Requirements
  – OSHA requires:
    • Charged hose lines, supplied by either fire hydrants or water trucks with pumps, or an equivalent system be available at all times that demolition activities are underway.
Response Equipment

• Demolition of Fire Sprinklers
  – During building alteration:
    • Never take sprinklers out of service unless absolutely necessary!
    • Valves operated only by authorized persons.
    • Quick modifications/ protection returned to service.
    • Valves checked daily.
Response Equipment

• Demolition of Fire Sprinklers
  – Modifications during building alteration:
    • Quick modifications/ protection returned to service.
    • Valves checked daily.
Response Equipment

• Standpipes
  – Must be:
    • Installed and put into service as soon as laws permit.
    • Maintained as construction progresses.
    • Twin inlets provided.
    • Located on exterior at street level.
    • Clearly marked.
Conclusion

• Summing Up
  – Take steps to recognize and eliminate fire hazards.
  – Pre-plan emergency response actions.
  – Know locations of response equipment, types, and how to use.
  – Apply what you have learned at work!
Summary

• Employers Responsibility

• Selected employer responsibilities under the Occupational Safety and Health Act of 1970.
  – Provide a workplace free from serious recognized hazards
  – Comply with standards, rules and regulations.
  – Inspect the worksite and examine workplace conditions.
  – Make sure employees have and use safe tools, equipment and maintain them.
  – Establish or update operating, safety and health procedures and communicate them.
  – Provide medical examinations and training when required.
  – Keep records of work-related injuries and illnesses.
  – Provide access to employee medical records and exposure records.

Summary

• Employer Responsibilities
• Employers have multiple responsibilities specific to fire prevention and protection.
• Selected general requirements include:
  – The employer shall be responsible for the development of a fire protection program to be followed throughout all phases of the construction and demolition work, and shall provide for the firefighting equipment as specified in the regulations. As fire hazards occur, there shall be no delay in providing the necessary equipment.
  – Access to all available firefighting equipment shall be maintained at all times. All firefighting equipment, provided by the employer, shall be conspicuously located.

Summary

• Employer Responsibilities
• Additionally,
  – The employer must ensure that all firefighting equipment shall be periodically inspected and maintained in operating condition. Defective equipment shall be immediately replaced.
  – As warranted by the project, the employer shall provide a trained and equipped firefighting organization (Fire Brigade) to assure adequate protection to life.
  – An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

TIP: "Fire brigade" means an organized group of employees that are knowledgeable, trained, and skilled in the safe evacuation of employees during emergency situations and in assisting in fire fighting operations.