Fire Safety Training

Introduction - Greeting Your Trainees

Good morning everyone. My name is _____, and I am your Safety Officer.
Today we are going to focus on Fire Safety. Fire is one of the oldest hazards known to people, and one of the fastest moving. A small ignition can become a room fire in 3 to 5 minutes. In industry and construction, fires start from hot work, electrical faults, flammable liquids and gases, poor housekeeping, smoking, and even simple friction. Our aim is simple: prevent fires from starting, detect them early if they do start, and evacuate or fight them safely so everyone goes home.
In this session you will learn how fires start, how to recognize the combustible and ignition sources around you, how to maintain good housekeeping and electrical safety, how to store and handle flammables, how to read and use fire extinguishers, and how to respond in an emergency. We will also cover evacuation, wardens, drills, and post-incident actions. By the end you should feel confident to identify hazards and apply safe practices on every shift.

1. What Fire Safety Means

Fire safety is not just about extinguishers on a wall. It is a system of controls, behaviors, and equipment that stops a small hazard from becoming a life threatening event. Fire safety means:
- Preventing ignition in the first place.
- Limiting fuel and oxygen where we can.
- Detecting and suppressing fires quickly.
- Evacuating people efficiently and accounting for them.
- Restoring operations without repeating the mistake.

On our sites, fire safety is built into design, equipment selection, work planning, training, and daily habits such as housekeeping and smoking control.

2. How Fires Start - Fire Triangle and Tetrahedron

The fire triangle shows the three basics: fuel, oxygen, and heat. Remove any one, and a fire cannot start or will go out. The fire tetrahedron adds a fourth element: the self-sustaining chemical reaction. Some extinguishing agents, such as dry chemical powders, interrupt that reaction.
Heat sources include sparks, open flames, hot surfaces, electrical arcs, friction, and spontaneous heating in oily rags. Fuels include solids like wood and paper, liquids like gasoline or paint thinner, gases like propane, and even dust clouds from flour, sugar, metal, or wood. Understanding the triangle helps you choose the right control: remove the fuel, cool the material, separate oxygen, or break the reaction.

3. Major Workplace Fire Hazards

Common hazards you must watch for include:
- Hot work operations that throw sparks or heat.
- Electrical faults, overloaded outlets, damaged cords, and poor bonding.
- Flammable and combustible liquids stored in open containers or near ignition sources.
- Gas cylinders mishandled or leaking.
- Combustible dust accumulation on floors, beams, and equipment.

- Kitchens and break rooms with unattended cooking.
- Space heaters, batteries, and chargers placed near combustibles.
- Smoking materials in non-designated areas.
- Poor housekeeping that leaves piles of packaging and waste.
Each of these can be controlled with planning, inspection, and discipline.

4. Legal and Company Requirements

Fire safety is governed by national and local codes and standards. Regardless of jurisdiction, most regulations require:
- A written fire safety plan and fire prevention program.
- Identification and control of specific hazards such as hot work and flammables.
- Installation and maintenance of detection and suppression systems.
- Training and drills for occupants and staff.
- Accessible egress routes and emergency lighting.
Our company policy meets or exceeds these requirements. We keep records of inspections, training, permits, and impairments to fire protection systems. If a code or policy seems unclear, ask the Safety Officer before proceeding.

5. Roles and Responsibilities

Fire safety is a team sport, and everyone has specific duties.
- Workers: Keep your area clean, store flammables properly, respect no-smoking zones, report hazards, and know how to use an extinguisher.
- Supervisors: Plan work, enforce permits, verify training, and correct unsafe behavior.
- Fire wardens/marshals: Lead evacuations, sweep zones, and account for people at assembly points.
- Safety Officer: Maintain the program, arrange drills, investigate incidents, and ensure systems are inspected.
- Contractors: Follow site rules, obtain permits, and coordinate with operations.
When a fire starts, confusion is your enemy. Clear roles and practiced actions save time and lives.

6. Fire Risk Assessment

Before a job begins, conduct a fire risk assessment:
1) Identify ignition sources: hot surfaces, electrical equipment, open flames, static electricity.
2) Identify fuels: packaging, solvents, oils, dust, foam, insulation, thatch, or vegetation.
3) Identify people at risk: workers, visitors, and neighbors including those who may need assistance.
4) Evaluate controls: housekeeping, storage, ventilation, separation distances, and automatic protection.
5) Decide additional actions: shielding, isolation, temporary detection, extra fire watch, or delaying work.
Document your findings and communicate them to everyone involved. Update the assessment if conditions change.

7. Prevention First - The Hierarchy of Controls

Use the hierarchy to reduce fire risk:
- Eliminate: choose cold cutting instead of welding.
- Substitute: use water-based adhesives instead of solvent-based.

- Engineer: install spark guards, interlocks, and ventilation; separate buildings by fire walls.
- Administer: permits for hot work; smoking rules; restricted areas; training.
- PPE: flame-resistant clothing, gloves, goggles, hearing protection for alarms.
PPE does not prevent a fire but protects you while you react. Prevention is the highest priority.

8. Housekeeping and Storage

Good housekeeping removes fuel and keeps exits clear. Apply the following rules:
- Keep floors clean and dry; remove waste regularly.
- Store combustible packaging away from ignition sources and outside exit routes.
- Do not block sprinklers or pile stock too close to the ceiling.
- Keep doors to electrical and mechanical rooms closed and free of clutter.
- Control oily rags in self-closing metal containers; empty them daily.
- Label all containers; do not store unknown liquids.
When in doubt, ask yourself: if a small fire starts here, what will it burn next? Then fix that chain.

9. Electrical Fire Safety

Electrical faults start many fires. To reduce the risk:
- Inspect cords and plugs for damage; replace if insulation is cracked.
- Do not overload outlets or power strips; avoid daisy-chaining.
- Keep equipment clean so cooling vents are not blocked.
- Use appropriate fuses and breakers; never bypass them.
- Maintain bonding and grounding of metal enclosures.
- Keep combustible materials away from battery chargers and inverters.
- Only qualified persons should service electrical systems.
If you see arcing, smell burning insulation, or notice flickering lights, report it immediately and isolate power if safe.

10. Hot Work Interface

Hot work is a leading cause of industrial fires. Coordinate hot work and fire safety by using the permit system, assigning a trained fire watch, removing or protecting combustibles, monitoring gases where needed, and maintaining a fire watch after work ends. Require clear communication with operations and with fire wardens if the job is in a public area. Never rely on a quick grind or a short tack weld being harmless.

11. Flammable Liquids and Gases

Flammable and combustible liquids have low flash points that produce ignitable vapors at room temperature. Follow these practices:
- Store liquids in approved safety cans and flammable storage cabinets.
- Keep containers closed; clean spills immediately.
- Ground and bond containers during transfer to control static electricity.
- Use intrinsically safe equipment in classified areas.
- Keep cylinders upright, capped, and separated by type; protect from heat and sunlight.
- Never store flammables in stair enclosures or exit corridors.
Remember that vapors are often heavier than air and can travel to distant ignition sources.

12. Combustible Dust

Dust from wood, grain, sugar, flour, plastics, coal, and metals can explode when suspended in air. Controls include:
- Keep surfaces clean to prevent dust layers; use vacuum systems rather than dry sweeping when possible.
- Enclose processes and provide local exhaust ventilation.
- Prevent ignition sources such as hot bearings, friction, or static sparks.
- Use listed dust collection equipment and maintain it.
- Conduct hazard analysis for combustible dust if your process can generate it.
A dust explosion can be devastating; treat dust like a flammable gas you can see.

13. Smoking and Open Flames

Smoking is allowed only in designated areas with safe receptacles. Never smoke near flammables, oxygen, or paint spray operations. Candles and other open flames are prohibited unless under a permit with strict controls. Communicate this rule to contractors and visitors.

14. Kitchens and Cooking Areas

Cooking is a major cause of fires. For site kitchens and break rooms:
- Never leave cooking unattended.
- Keep combustibles away from hotplates and microwaves.
- Maintain and clean hoods and filters to prevent grease buildup.
- Ensure Class K extinguishers are provided for deep-fryer areas.
- Know where the emergency gas shutoff is.
- Train staff on how to smother a pan fire by covering with a lid and turning off heat; never use water on grease fires.

15. Fire Detection and Alarm Systems

Early detection saves time and life. Know your systems:
- Smoke and heat detectors connected to a fire alarm control panel.
- Manual pull stations at exits.
- Audible and visual alarms for noisy areas.
- Monitoring services that alert the fire department.
Report impairments, trouble signals, or false alarms immediately. Never disable a detector or alarm without authorization and compensating measures recorded by the Safety Officer.

16. Fire Protection Systems

Protection systems control or extinguish fires before they grow:
- Portable extinguishers in accessible, clearly marked locations.
- Automatic sprinklers that discharge water when heat opens a head.
- Standpipe and hose systems for trained responders.
- Fixed systems such as foam, gaseous clean agents, and kitchen hood suppression.
Keep valves open, test water supplies, and ensure clear access to risers, hydrants, and FDC connections. Document all inspections.

17. Fire Extinguishers - Types and Use

Select the right extinguisher for the fuel:
- Class A for ordinary combustibles like wood and paper.
- Class B for flammable liquids and gases.
- Class C for energized electrical equipment.
- Class D for combustible metals.
- Class K for cooking oils and fats.

To use an extinguisher, remember PASS:
P - Pull the pin.
A - Aim at the base of the fire.
S - Squeeze the handle.
S - Sweep side to side.

Only attempt to extinguish a small, incipient fire if you have a clear exit behind you, you have the right extinguisher, and you have been trained. If in doubt, evacuate and close doors to confine the fire.

18. Emergency Preparedness

Preparation turns panic into action. Our emergency plan includes:
- Marked evacuation routes and exits with emergency lighting.
- Assembly points at safe distances.
- An accountability process using roll calls or electronic systems.
- Special assistance plans for persons with disabilities or medical needs.
- Procedures to secure equipment and hazardous processes during evacuation.
- Contact lists and a chain of command.

You must know two ways out from your work area and your assembly point before you start each shift.

19. Drills and Fire Wardens

We conduct drills to practice evacuation under realistic conditions. Fire wardens are appointed for each zone. Their duties include:
- Start evacuation when the alarm sounds or on order.
- Sweep their area, including restrooms and ancillary rooms, without putting themselves at risk.
- Direct occupants to assembly points and prevent re-entry until cleared.
- Report headcounts and missing persons to the incident commander.

After each drill, we review performance and fix any problems found.

20. Evacuation - Step by Step

When the alarm sounds:
1) Stop work immediately and make equipment safe if it is quick to do so.
2) Leave by the nearest safe exit; do not use elevators unless directed by the fire service.
3) Help those who need assistance as assigned in the plan.
4) Close doors behind you to slow fire and smoke.
5) Do not go back for personal items.
6) Move to your assembly point and stay with your group.
7) Report any hazards or trapped persons to a warden or responder.

Evacuation is not a race; it is a calm, practiced routine.

21. Persons Requiring Assistance

Plan ahead for colleagues, visitors, and contractors who may need help to evacuate. Methods include buddy systems, evacuation chairs, areas of refuge with two-way communication, and stairwell assistance teams. Never attempt a risky rescue; instead, follow the plan and inform the incident commander of the person's location.

22. Communication During an Emergency

Clear communication reduces confusion. Use simple language, repeat key instructions, and keep radio channels clear. The incident commander will coordinate with fire services and announce the all-clear. Do not spread rumors; rely on official updates.

23. After the Incident - Investigation and Recovery

Once the fire is out and the scene is safe, we investigate to learn the root causes. We capture witness statements, photographs, and equipment data. We review training, permits, and maintenance records. We also plan for business continuity: securing the site, cleaning smoke and water damage, and restoring critical operations. Lessons learned translate into updated procedures and training.

24. Training and Competency

Fire safety knowledge fades without practice. Our program includes:
- Induction training for all new workers and contractors.
- Task-specific training for hot work, electrical work, kitchen staff, and laboratories.
- Annual refresher training on extinguisher use and evacuation.
- Warden training on leadership during emergencies.
- Records of participation and competency assessments.

You will only be confident in a real emergency if you have practiced the skills in training.

25. Common Mistakes to Avoid

- Blocking exits with equipment or storage.
- Disabling detectors for convenience.
- Storing flammables in open containers or near ignition sources.
- Ignoring dust buildup.
- Leaving cooking unattended.
- Using the wrong extinguisher or aiming at flames instead of the base.
- Propping fire doors open.
- Forgetting to maintain clearance under sprinklers.
- Skipping the post-work fire watch after hot work.

Learn these errors and avoid them every day.

26. Practical Scenarios and Case Study

Scenario 1: You see smoke coming from a waste bin near a grinder. Action: pull the alarm, use a Class A extinguisher if safe, and call the fire department. Investigate housekeeping and spark containment.
Scenario 2: A paint store smells strongly of solvent. Action: stop ignition sources, ventilate, check storage containers, and review bonding and grounding procedures.

Case Study: A small manufacturing plant suffered a night fire traced to charging stations lined up against a plywood wall. Cables were coiled tightly, causing heat buildup. The fix included spacing chargers, using non-combustible backing boards, and adding temperature monitoring and housekeeping checks.

27. Summary and Key Messages

- Fire safety is everyone's responsibility and begins with prevention.
- Know your hazards, keep areas clean, and store flammables correctly.
- Use permits and trained fire watches for hot work.
- Understand your detection and suppression systems and never disable them.
- Use the right extinguisher with PASS only for small incipient fires.
- Practice evacuation; know two ways out and your assembly point.
- After any incident, learn and improve the program.

By applying these practices, we protect people, property, and the business every day.