

FIRE PROTECTION SAFETY

Terminal Objective

Identify in-place fire protection systems and procedures

Enabling Objectives

- EO1 Identify the types of fire extinguishers used at Pantex
- EO2 Identify the five classes of fire
- EO3 Identify proper use of fire extinguishers
- EO4 Identify proper procedures for reporting a fire
- EO5 Identify the objectives and task for performing Fire Watch
- EO6 Identify types of fire barriers
- EO7 Identify lessons learned from industrial fires
- EO8 Identify transient fire load
- EO9 Identify fire protection systems
- EO10 Identify smoking policy

Pantex Fire Department Personnel

Texas IFSAC certified Firefighters and Texas Department of State Health Services

Paramedics certified and licensed by the Texas Department of State Health Services and registered with the National Registry of Emergency Medical Technicians



Pantex Fire Department Support Team

Plant personnel who voluntarily train and respond to the Fire Department for support during emergency operations such as wildland fires, rehab, and staging operations

Pantex Fire Department Contact Numbers

Emergency numbers

Off-site: 477-3333

On-site: 3333

Non-Emergency:

On-site: 4454

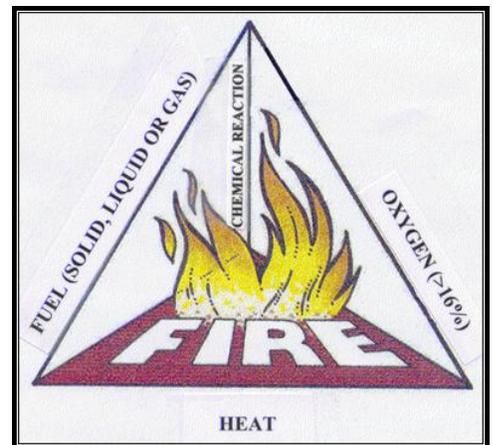
CAUTION!!!

It is important to follow the rules... Sometimes the reasons are more obvious than others.

An uncontrolled fire can double in size every 2 minutes.....
Time is critical!

The Fire Tetrahedron

Heat
Fuel
Oxygen
Sustained Chemical Chain Reaction



Fire Behavior

Mushrooming and Stratification are fire behaviors that can have deadly consequences.

Fire produces flame, heat, and deadly gasses that first rise, then form layers (strata) that begin forming closer, and closer to the floor

If heavy smoke conditions are encountered *stay low* and *Crawl* along the floor to a safe exit

Heat is transferred by:

Conduction, Radiation, and Convection

Types of fire extinguishers used at Pantex (EO1)

- **Pressurized Water Fire Extinguisher**
- **Multipurpose ABC Dry Chemical for use on**
(The most prevalent fire Extinguisher at Pantex)

Class A fires (ordinary combustibles)

Class B fires (flammable liquids)

Class C fires (electrical) fires

- **Dry Powder Extinguishers for use on Class D, flammable metal fires**

NOTE: *These extinguishers are only to be used by personnel with specialized training*

- **Wet Chemical extinguishing agent for use on Class K (cooking oil and grease) fires**
- **Others:** Carbon Dioxide and Halon

NOTE: Carbon Dioxide *can be* an *asphyxiant*.

Carbon Dioxide Fire Extinguishers are not used as a *principal* extinguishing agent at any DOE Facility

NOTE: Halon is suspected of being an “*ozone depleter*”. These systems are being removed from all DOE Facilities

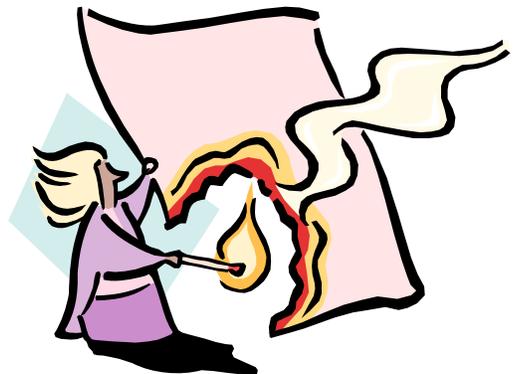
Classifications of Fires (EO 2)

Class A

Ordinary combustibles

Leaves an ash product when burned

- 1) Wood
- 2) Paper
- 3) Leaves
- 4) Some plastics



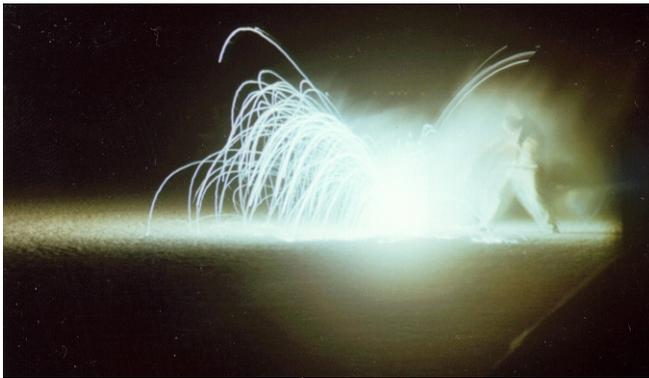


Class B

Flammable liquids
Things stored in barrels
Hydrocarbons
Gasoline
Diesel
Solvents

Class C

Electrical equipment



Class D

Combustible Metals
Sodium
Magnesium
Lithium ...

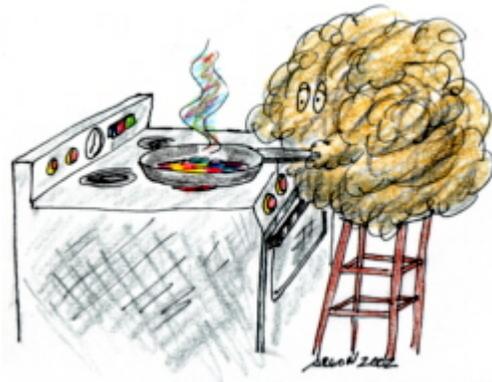
These fires liberate tremendous amounts of

energy, especially heat and light

They react unpredictably when extinguishing agents are applied

Class K

Kitchen fires
Cooking oils and fats



How to Use a Fire Extinguisher (EO3)

NOTE: At no time let the fire block your exit

Ensure that the extinguisher will work.

Check the needle is in the green area of the gauge
At approximately 8-12 feet from the fire, place the extinguisher on the floor.

Use the **PASS** method to operate the fire extinguisher

The **PASS** Method

Pull the pin from the handle
(Discharge a small amount of the agent to ensure operability)

Aim the nozzle at the base of the fire

Squeeze the discharge handle

Sweep the nozzle back and forth at the base of the fire



Decision Time

If the fire is small (wastebasket ...)

Decide whether or not you are going to attempt to extinguish the fire

If you choose to fight the fire, use the appropriate fire extinguisher for extinguishment.

NOTE: If you have any doubt about your ability to extinguish the fire, activate the fire alarm and suppression systems (if applicable) and go to your muster station

If the fire is large **DO NOT** attempt to extinguish the fire!!!

Immediately Activate manual fire suppression system (if applicable) as you leave the area

Evacuate the facility (close doors)

Go to your muster station...unless otherwise required to stay in the area (shelter in place)

Procedures For Reporting a Fire (EO4)

Notify personnel in the affected area by pulling the manual fire alarm and/or yelling...**FIRE**

Notify the Fire Department by calling...**3333**

Objectives of Fire Watch (EO5)

What is Fire Watch?

Personnel who perform a Fire Watch will utilize administrative procedures and receive “Specific Training” to assure compliance with specific requirements

Fire Watch is a function performed in a facility or plant structure where part of the engineered fire protection system is impaired or out-of-service. Or other circumstances that requires posting a fire watch.

What are the requirements of Fire Watch personnel?(EO5)b

- * Personnel assigned fire watch must wear required **personal protective equipment** (**Safety Glasses, Safety Shoes, etc...**)

- * **Continuous monitoring** of the area for **signs of a fire** (smoke, odor, heat, etc...).
- * Have an appropriate **portable fire extinguisher** available and accessible at all times.
- * Be aware of the **impaired condition** of the facility fire suppression system, or other circumstances which require fire watch
- * Be aware of any fire suppression system **actuation methods** (deluge systems...etc.).
- * Receive **“Specific Training”** on the use of portable fire extinguishers.
- * Receive **“Specific Training”** on how to initiate a fire alarm in the watched area and **notify** the fire department.

A person performing Fire Watch duties is not to perform other duties (EO5)b

- * The only exception is providing Nuclear Explosive Safety (NES) Zone Coverage while performing Fire Watch

A person performing Fire Watch duties may participate in two-person zone coverage only

- * **This excludes person-to-person coverage**

Pre-Assignment Task for Fire Watch (EO5)c

- * Identify **any impairments** of fire suppression system or equipment
- * Identify **locations of fire suppression system** (deluge) and fire extinguishers
- * Identify **evacuation routes**

- * Identify and locate **manual fire alarm** (for alerting personnel in the fire watch area)
- * Locate **telephone(s)** to notify the Fire Department **#3333**

Types of Fire Barriers (EO6)

- **Fire Walls**

Designed for stability as well as fire resistance

Must contain the fire and products of combustion on the side of origin

**Smoke
Heat
Fire gasses**

Cannot be breached without proper engineering and approval

- **Fire Doors**

Rated and provide protection for openings in fire walls

The doors include the frame and hardware

- **Fire dampers**

Normally located in enclosed spaces such as air ducts and air handlers.

- **Ceiling tiles**

Rated and must be in place to contain heated gasses, smoke, and flame to the area of origin.

- **Requirements for fire barriers**

There are no hazards to employees from a fire.

No threat to the public or environment will result from a fire.

DOE programs will not suffer unacceptable delays because of fire.

Property damage will be held to a minimum.

What you should do if fire barriers are found damaged or inoperable:

- **Notify your immediate supervisor.**
- **Call the Fire Department at extension 4454 and report the problem to the Shift Officer.**
- **When Plant craft personnel take a fire barrier out of service, they are to notify the Fire Department and place the fire barrier back into service upon completion of work or compensatory measures must be put into place.**

Lessons Learned From Industrial Fires ... (E07)

A door blocked open in a chemical lab allowed a fire to extend unchecked - - \$2 Million Loss

Breached firewall in a school - - \$1 Million Loss

Inoperative fire door closures in an office building - - \$1 Million Loss

Identify Transient Fire Load (E08)

Transient Fire Load

Any combustible material that can be moved in and out of the work area

- Paper**
- Cardboard boxes**
- Packing materials and shipping palates**
- Flammable materials or products**

NOTE: *When visiting a bay or cell, maintain control of all combustibles that you bring in; take them out when you leave*

Pantex Plant promotes safe work practices and fire prevention through good housekeeping

Excessive accumulation of transient fire loading could overwhelm a fire protection system

Transient fire loading can be found in all areas of the plant

Flammable storage cabinets are utilized for storage of transient flammable and combustible materials

Identify Fire Protection Systems (EO9)

Sprinkler systems are for protection of *facilities* and *equipment*

- **Dry Pipe Sprinkler System:** For buildings subject to freezing temperatures
- **Wet Pipe Sprinkler System:** For heated buildings
- **Sprinkler System Risers** are *always* located in a heated area; generally the equipment room of the facility.
- **Sprinkler System Heads**
 - a. **Normal activation temperature of heads is 165° F**
 - b. **Pendent Sprinkler Heads** hang down from the water supply pipe.
 - c. **Up-right Sprinkler Heads** are mounted on the top of the water supply pipe to prevent being damaged from below

Deluge Systems

Designed for the protection of *personnel* located in high-hazard operation areas

Manual Pull Boxes

Manual fire alarm systems for sending alarm signals to the Fire Department

If you smell smoke, activate a manual pull box

When the fire alarm bell sounds, YOU should

Evacuate to assigned mustering station and ensure accountability is documented

Stay in mustering station *until “all clear” is given from a supervisor, the Fire Department, or Security Police Officer*

Identify Smoking Policy (EO10)

**No open flame materials are allowed on plant site inside the protected area (matches, lighters).
If you smoke, you must do so in designated areas only where electronic lighting devices are installed.**

Smoke Detectors

Smoke detectors save lives!!!

Early warning devices which notify occupants of danger much sooner than heat detecting devices

Work best when ...

**Maintained and tested regularly and ...
Used in conjunction with home fire drills**