Section 35.0
FIRE PREVENTION AND INCIPIENT FIRE FIGHTING

A. Purpose

The purpose of this procedure is to establish fire prevention practices and incipient fire fighting procedures for **JAGUAR ENERGY SERVICES, LLC** personnel and aid **JAGUAR ENERGY SERVICES, LLC** in complying with OSHA 29 CFR 1910.157.

B. Scope

This procedure applies to all **JAGUAR ENERGY SERVICES, LLC** personnel while on **JAGUAR ENERGY SERVICES, LLC** or client work sites.

Training is mandatory on this procedure because **JAGUAR ENERGY SERVICES, LLC** and clients have provided fire extinguishers for all vehicles and work locations.

This will familiarize the employees of the general principals of fire extinguisher use and the hazards involved in incipient fire fighting.

C. Responsibilities

1. The Safety Coordinator or his/her designee responsible for ensuring that **JAGUAR ENERGY SERVICES, LLC** personnel obtain initial training on API T1 and offshore safety before being assigned to offshore jobs.
   - (a) Additional responsibilities include:
     - (i) The implementation of this Policy.
     - (ii) To maintain a record of the training of each of their employees at a local or central location, in accordance with the provision of this Recommended Practice.
     - (iii) Documentation of the training shall be furnished to those employees whose assigned work location varies.
     - (iv) Providing, upon written request, an employee's training records to the employee, their representative, or any government agency.

2. The Supervisor is responsible for providing assistance in the implementation of this policy.

3. **JAGUAR ENERGY SERVICES, LLC** personnel are responsible for acquainting themselves with the local fire protection equipment when working at customer sites.
   (a) Additional responsibilities include:
      (i) Completing fire fighting training.
      (ii) Applying proper safe practices on fire prevention as taught in the required training.
      (iii) Ensuring that they are familiar with emergency action plans and personnel accounting procedures while working at customer sites.

D. Procedure

1. All fires on **JAGUAR ENERGY SERVICES, LLC**'s or clients' property shall be reported immediately.
   (a) A written report will be filed with the Safety Director.

2. Fire prevention measures are efforts to reduce the incidence of fires by eliminating opportunities for ignition of flammable materials.
   (a) **JAGUAR ENERGY SERVICES, LLC** personnel must be able to recognize fire hazards and take appropriate actions to prevent accidental ignition of a fuel source.
   (b) Smoking must be confined to areas specifically designated by the client and/or **JAGUAR ENERGY SERVICES, LLC** management.
   (c) Smoking is not permitted in the immediate vicinity of tank batteries, process areas, or any area suspected to contain flammable vapors, regardless of whether a "NO SMOKING" sign is displayed.
   (d) Any area subject to contamination by flammable liquids or gas should be designated as a "NO SMOKING" area and a sign to that effect should be displayed.

3. Ignition Sources

Industrial fires can have many sources of ignitions.
   (a) If an ignition source contacts a fuel source, such as an oil leak in or around turbo-machinery, a fire could result.
   (b) If a leak is detected, stop work immediately and repair the leak.

(c) Use a personal gas monitor to continually monitor the atmosphere.

4. The following chart lists sources of ignition with examples and their basic preventive measures.

Ignition Sources
Examples and Preventative Actions of Industrial Fires

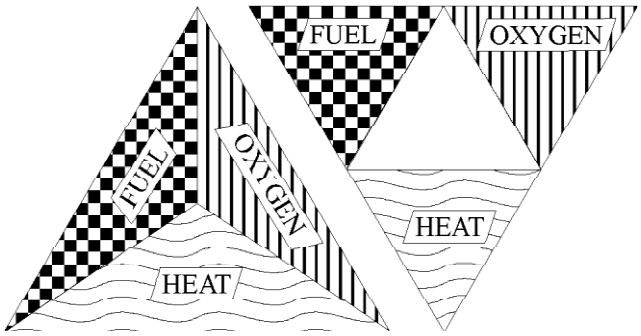
IGNITION SOURCES (Descending order of frequency)	EXAMPLES	PREVENTIVE ACTIONS
Electrical	Electrical defects in wiring, motors, switches, lamps, and hot elements.	Use only approved equipment. Follow National Electrical Code. Establish regular maintenance.
Friction	Hot bearings, misaligned or broken machine parts, jamming of material, poor adjustment.	Follow a regular schedule of inspection, maintenance, and lubrication.
Foreign substances	Tramp metal, which produces sparks when struck by rapidly revolving machinery.	Keep foreign material from stock. Use magnetic or other separators to remove tramp metal.
Open flame	Cutting and welding torches (chief offenders). Gas and oil burners. Misuse of gasoline torches.	Follow established welding precautions. Keep burners clean and properly adjusted. Do not use open flames near combustibles.
Smoking, matches and lighters	Dangerous near flammable liquids and in areas where combustibles are used or stored.	Smoke only in permitted areas. Make sure matches are out. Use prescribed receptacles. The use of butane lighters is prohibited in most gas plants. A double action lighter, such as a *Zippo*, is acceptable in approved smoking areas.
Spontaneous ignition	Deposits in flues. Low-grade storage. Industrial wastes. Oily waste and rubbish. Oil and liquid fuels. Hot turbine surfaces.	Clean flues frequently. Remove waste daily. Isolate stored materials likely to heat spontaneously.
Hot surfaces	Exposure of combustibles to furnaces, hot flues, electric lamps, hot metal, hot turbine surfaces.	Provide ample clearances, insulation, air circulation. Check heating apparatus before leaving it unattended.
Combustion spark	Rubbish burning and process equipment.	Use incinerators of approved design. Provide spark arresters on stacks. Operate equipment carefully.

Overheated materials	Abnormal process temperatures. Overheating of flammable liquids.	Have careful supervision and competent operators, supplemented by well-maintained automatic temperature controls.
Static electricity	Dangerous in presence of flammable vapors. Occurs where liquid flows from pipes.	Ground equipment. Use static eliminators. Humidify the atmosphere.

1. Fire Pyramid

In addition to identifying ignition sources, Field Service Personnel should be familiar with the *fire pyramid*. (x-ref graphic)

2. The four basic elements of a fire can be viewed as a pyramid.



(a) The four sides of the fire pyramid are oxygen, fuel, ignition source, and chemical chain reaction.

(b) Field Service personnel may be more familiar with the *fire triangle* approach to fire prevention, which was acceptable fire prevention theory for many years.

(c) Modern fire protection theory shows the fire triangle remodeled into a fire pyramid.

(d) A fourth side has been added to account for the chemical reaction needed to sustain combustion.

(e) As with the triangle, removal of any side will put out or prevent a fire.

(f) Examples of how the fire pyramid theory applies to preventing or extinguishing a fire include:

(i) Oxygen removal, such as inerting a vessel with nitrogen.

(ii) Fuel removal, such as wetting down or moving nearby combustibles when welding.
(iii) Heat source removal, such as use of non-sparking tools or friction control maintenance.
(iv) Chemical chain reaction, such as using halon to put out a fire.

3. Fire Prevention Housekeeping

Fire prevention housekeeping is an important aspect in the prevention of industrial fires.

(a) **JAGUAR ENERGY SERVICES, LLC** personnel should follow established housekeeping rules and practices:
(i) Maintain good housekeeping at all work locations and in all vehicles.
(ii) Promptly cleanup spills and properly dispose of contaminated rags and sorbent materials.
(iii) Store combustible materials such as oil soaked rags, waste and shavings in approved metal containers with self-closing lids.
(iv) Containers should be emptied daily.
(v) Do not allow combustible materials such as paper to accumulate.
(vi) Use grounding and bonding to prevent static electric sparking when dispensing or transferring flammable liquids.

4. Flammable and Combustible Liquid Storage

An important fire prevention measure is the safe storage of flammable and combustible liquids.

(a) Flammable and combustible liquids are classified according to the chart below.

Flammable and Combustible Liquid Classes

	Class	Flash Point (°F)	Flash Point (°C)	**Boiling Point (°F)**	**Boiling Point (°C)**
Flammables	IA IB IC	<73 <73 ≥73 and <100	<22.6 <22.6 ≥22.6 and <37.4	<100 ≥100	<37.4 ≥37.4
Combustible	II IIIA IIIB	≥100 and <140 ≥140 and <200 ≥200	≥37.4 and <59.4 ≥59.4 and		

			<74.8 ≥74.8		

(a) The primary purpose of a flammable safety cabinet is to isolate flammable and combustible liquids and to serve as a barrier between the liquids and a fire.

(b) Storage capacity of safety fire cabinets and chemical storage rooms depends on the classification of the liquid.

(i) Up to two gallons (7.6 liters) of Class I A liquids can be safely stored in a two gallon (7.6 liter) safety can.

(ii) All other classes can be safely stored in a five gallon (18.9 liter) safety can.

(iii) Safety cans must have a spring closed lid.

(c) The maximum quantity of Class I or Class II liquids that can be stored in a flammable cabinet is 60 gallons (227 liters).

(d) The maximum quantity for Class III, or combination of all classes is 120 gallons (454 liters).

(e) Flammable cabinets must remain latched shut and should only be used for storing flammable and combustible liquids.

(f) Personal protective equipment, paper, cardboard, or rags should not be stored in a flammable storage cabinet.

(g) Safety Cabinets do not have to be ventilated.

(h) If a safety cabinet is not ventilated, the vent opening in the cabinet must be sealed.

(i) Ventilated fire safety cabinets must exhaust outdoors using a non-sparking exhaust fan and have a flash arrestor screen in place.

2. Fire Extinguishers

(a) There are four classes of fires.

(b) Each class of fire burns a particular fuel type and is extinguished with a specific type of extinguisher as illustrated in the chart below.

Classes of Fires

Class of Fire	Fuel	Typical Fire Extinguisher to Use	Cautions Needed
A	Wood, Paper, Trash	Water, antifreeze, soda-acid, foam, aqueous film foam forming (AFFF), wetting agent	Drench debris and look for “hot spots” left behind

B	Flammable Liquids, Gases	CO_2, Dry Chemical, AFFF	Dry chemicals leave a corrosive residue. CO_2 displaces oxygen.
C	Electrical	CO_2 , Dry Chemical, Halon	NEVER use water except as a fog
D	Metals	Specialized Extinguishers	Leave to Experts

(a) Prior to starting work at any site, Field Service Personnel must determine where fire extinguishers and other fire extinguishing equipment are located.

(b) Field employees must inspect the extinguishers in their immediate work area, to ensure that the safety pin is intact and that the extinguisher is full and has a valid inspection tag.

(c) Field Service Personnel must also be acquainted with the site specific emergency action plan including emergency phone numbers, paths of egress, and rally points for personnel accounting.

2. Inspection of Fire Extinguishers

(a) Fire extinguishers must be visually inspected on a monthly basis.

- (i) This inspection includes:
  - (i) Visual inspection for damage or corrosion.
  - (ii) Check for pin and seal.
  - (iii) Check to ensure extinguisher is full.
  - (iv) Check to ensure extinguisher is properly located and accessible.

(b) In addition to the monthly inspections, extinguishers must undergo an annual maintenance check.

- (i) The record of the maintenance check date should be maintained for one year after the last entry of life of the shell or whichever is less.
- (ii) Under certain conditions a fire extinguisher must be removed from service.
- (iii) These conditions include:
  - (i) Failure to pass a hydrostatic test.
  - (ii) Demonstrated lack of fitness for hydrostatic testing such as when:
  - (iii) The unit has been repaired by solder, welding, brazing or patching compound.

(iv) The cylinder or shell threads are damaged.

(v) There is corrosion that has caused pitting, including corrosion under removable name plate assemblies.

(vi) The extinguisher has been burned in a fire.

(vii) Calcium chloride has been used in a stainless steel shell.

(c) Fire extinguisher hose assemblies equipped with a shut-off nozzle at the discharge end of the hose must be hydrostatically tested at the same interval as the cylinder to which it is attached.

(i) They do not need to be stamped.

(d) Fire extinguishers should not be filled with material other than that which is designated on the label.

3. It is the responsibility of the local fire department or customer or **JAGUAR ENERGY SERVICES, LLC** fire brigade to respond to and extinguish fires.

4. **JAGUAR ENERGY SERVICES, LLC** personnel may provide initial response to a small fire with a fire extinguisher.

5. When fighting a small fire with a fire extinguisher follow the **P.A.S.S.** method:

(a) P - Pull the pin.

(b) A. – Aim toward the front base of the fire, upwind, from a distance of 8 feet (2.5 meters).

(c) S. – Squeeze the trigger.

(d) S. – Sweep the extinguisher in a back and forth motion.

6. Fire Emergency Procedure

(a) **JAGUAR ENERGY SERVICES, LLC** personnel should respond to a fire emergency using the following procedure:

(i) Notify emergency responders of the fire.

(i) It is the responsibility of the local fire department or customer fire brigade to respond to, and extinguish, a fire.

(ii) After emergency personnel have been notified, **JAGUAR ENERGY SERVICES, LLC**

personnel may attempt to extinguish a small fire with a fire extinguisher.

(i) When fighting a small fire with a fire extinguisher follow the PASS method.

(iii) Stay upwind of a fire and stay clear of the flames. Report to an emergency assembly point.

(iv) After a fire is extinguished, observe the area to ensure that there is no danger of re-ignition.

(i) Do not ever turn your back on an apparently extinguished fire.

(v) Do not return to work until local officials have declared that it is permissible to do so.

7. Seal-Tite, LLC has provided portable fire extinguishers for employee use in the workplace, therefore it is mandatory that they provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved in incipient stage fire fighting.

B. Training Requirements

1. **JAGUAR ENERGY SERVICES, LLC** personnel will be trained on the following topics:
   (a) Fire prevention and theory
   (b) Hazards involved in the incipient stage of firefighting.
   (c) Fire safety housekeeping.
   (d) Proper storage of flammable and combustibles.
   (e) Proper use of fire extinguishers in the incipient stage of firefighting.
   (f) The contents of this procedure.

C. Training Frequency

1. **JAGUAR ENERGY SERVICES, LLC** personnel will be trained according to the following schedule:
   (a) Initially upon hire.
   (b) Every 12 months.

D. Definitions

1. **Flammable liquid** is any liquid having a flash point below 100 ^{0}F (37.4 ^{0}C).

2. **Combustible liquid** is any liquid having a flash point at or above 100 ^{0}F (37.4 ^{0}C).

3. **Flammable gas** is a gas that at ambient temperature and pressure forms a flammable mixture with air at a concentration of 13% by volume or less; also, gas that at ambient temperature and pressure forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.

4. **Flashpoint** for flammable fuel in equilibrium with their vapors, the flashpoint is the maximum temperature below which there is insufficient vapor to form a flammable vapor-air mixture.

5. **Lower Flammable Limit (LFL)** is the minimum concentration of vapor to air below which propagation of a flame will not occur in the presence of an ignition source. Below this level the concentration is considered to be too lean.

6. **Upper Flammable Limit (UFL)** is the maximum vapor to air concentration above which propagation of a flame will not occur in the presence of an ignition source.

Above this level the concentration is considered to be too rich.