

For **Oil & Gas Industry**

SMART FIRE SAFETY TRAINING

Scalable solutions can help reduce risks,
protect valuable resources and save lives.





Introduction

It only takes a few seconds for a small fire at an oil or gas refinery to become a huge problem. If the fire breaks out in a remote section of the facility, emergency crews can lose valuable time getting there. Even if a fire starts in an easy-to-access location, the combination of intense flames and extremely flammable materials can be disastrous.

That's why fire safety training is so important for people who work in the oil and gas industry.

Proper extinguisher training helps workers respond quickly and confidently to an emergency. Live-fire drills and advanced digital training keep refinery firefighting teams ready for action.

Together, these training sessions help companies protect their people, resources and communities.

This paper explores fire safety training for the oil and gas industry. It also addresses fire science basics and modern training tools that can help prevent disasters at refineries.



A Constant Concern

Although refineries have strict safety protocols in place to prevent fires, accidents still occur.

Several refinery fires have made the news in recent years—including a ground-shaking explosion at a Southern California facility that sent towering flames into the air that were visible for miles. No one was hurt in the blast, but serious injuries and loss of life are always a concern in large fires.

Refinery fires also can cause significant financial losses. Damaged facilities need to be repaired or replaced. Regional fuel prices can rise when production levels drop. And local businesses may have to close until the fire is out. There's also the environmental fallout: Leaking gas and oil can seep into nearby land, and fires can release toxins into the air.

Fire extinguishers serve as the first line of defense during the early stages of a fire. But for that defense system to work, employees need quality extinguisher training.

Aging Infrastructure

There's been a spike in fires and explosions at refineries in Texas and Louisiana, where many of the largest facilities are more than 80 years old.

11 Incidents from 2013-'17 **40** Incidents from 2018-'22

Source: "Plant & Refinery Explosions Tripled in Frequency from 2018-2022," Arnold & Itkin LLP



The Future of Fire Safety Solutions



Traditional fire extinguisher training can be messy, costly and time-consuming. But as technology improves, companies are changing how they teach fire safety.

Digital training systems have become more popular in recent years, thanks to their combination of realism and safety. They're easy to set up and can be used in any location where fires can occur. And because they're fully digital, there's no need to clean up chemicals or water after a training session.

The two products below are at the forefront of the digital revolution.



LED simulators

These systems, which use laser-driven extinguishers and LED panels that mimic a real blaze, have helped train thousands of workers across the country. Sensors in the panel react to the extinguisher's laser, and the digital flames only go out if trainees use proper techniques.



Key benefits

- **Easy-to-use:** Most LED simulators can be plugged in and set up in a matter of minutes.
- **Responsive:** Trainees get immediate feedback and can adjust their technique on the fly.
- **Immersive:** Some simulators can be wirelessly paired with smoke machines and alarms.
- **Cost-effective:** These systems eliminate ongoing costs like fuel and new extinguishers.



VR training systems

Virtual reality systems are the latest advancement in fire safety training. They feature high-tech VR headsets and extinguisher props to let users battle virtual flames in immersive and realistic environments, often with interactive features like timed competitions and gamification.



Key benefits

- **Portable:** Most systems are lightweight and run on batteries, so they can be used anywhere.
- **Flexible:** Instructors can choose from a variety of fire types and workplace environments.
- **Shareable:** Training sessions can be recorded and watched in meetings or online events.
- **Enhanced engagement:** Some systems can cast the scene from inside the headset to a second screen to promote group participation.



The Importance of Hands-On Training

While theoretical knowledge is valuable, hands-on extinguisher training shows users how to respond safely to a real fire emergency. Training helps them:

- ✓ **Develop muscle memory:** Handling an extinguisher helps build confidence and familiarity, making it easier to act under pressure.
- ✓ **Memorize P.A.S.S.:** Training reinforces the P.A.S.S. method (Pull, Aim, Squeeze and Sweep) and helps instill proper techniques.
- ✓ **Understand fire situations:** Practice helps people know when a fire can be extinguished and when evacuation is the best option.
- ✓ **Enhance decisions:** When people train in simulated conditions, they're more likely to react correctly in real situations.



THE P.A.S.S. METHOD

PULL out pin on handle.

AIM nozzle at base of fire.

SQUEEZE handle to use extinguisher.

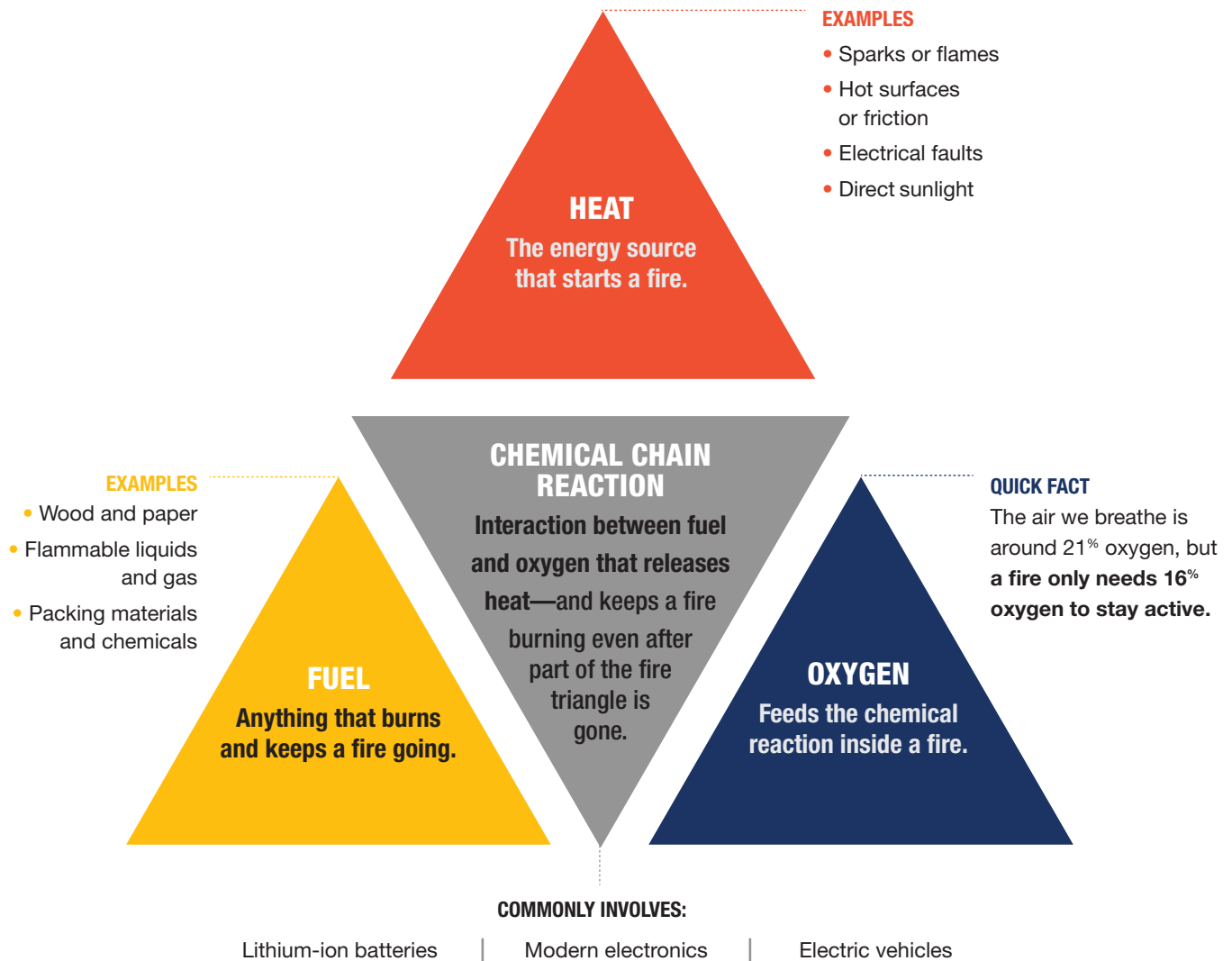
SWEEP side to side until fire is out.





Inside the Fire Tetrahedron

To understand how extinguishers work, you first need to understand the science behind fires. For decades, the fire triangle was the building block of fire safety training. It consisted of heat, fuel and oxygen. But modern science has introduced a fourth element—the chemical chain reaction—to create the fire tetrahedron.



PUTTING OUT THE FLAMES

To extinguish a fire, you need to do at least one of the following:

- Cool the fire to remove heat
- Remove or isolate the fuel to stop combustion
- Smother the fire to deplete oxygen
- Interrupt the chemical reaction to end self-sustaining flames



Live-Fire & Advanced Digital Solutions

Refinery fire brigades require special training to deal with emergencies at oil and gas facilities. Firefighters on these teams must undergo rigorous training to meet NFPA and OSHA certification standards. These include at least one live-fire drill every 12 months and special hazmat training to understand the unique challenges of working with hazardous materials.

Firefighting Options

Oil and gas fire brigades often train on live-fire props that resemble wellheads, tank batteries and other site-specific structures. These heavy-duty products typically use propane flames to create safe training sessions. Some departments also have full-scale training complexes that simulate sections of a refinery.

Firefighting teams can supplement their live-fire training with advanced digital solutions. These products use digital nozzles and LED panels that mimic flames, and they often pair with smoke generators to create fully immersive experiences.

Hazmat Options

All fires are dangerous. But fires at refineries are especially dangerous because they often involve hazardous materials, which require special training to handle and extinguish.

Hazmat training props can safely simulate these high-risk situations and help teams prepare for hazardous material leaks and fires at refineries. Firefighters can work on large-scale props to practice dealing with cracks, punctures, ruptures and broken valves—gaining valuable hands-on experience that goes far beyond standard firefighter training.



Firefighting teams can supplement their live-fire training with advanced digital solutions.

Conclusion

Be Proactive, Not Reactive

Fire extinguisher training is an essential part of safety in the oil and gas industry.

Effective training programs reduce risks, protect valuable resources and save lives. With quality training, employers can prepare their workers to respond confidently in an actual emergency.

The same holds true for firefighting teams. They need consistent, reliable and safe training options that help them perfect their skills and meet regulatory requirements.

And while the best training may not be the cheapest option, the best solutions help pay for themselves. They're repeatable and scalable, which helps companies stay on budget.

Put simply, an investment in fire safety training is an investment in an organization's overall safety and well-being.



We've been in business for more than 125 years, and we're a global leader in fire safety. We provide cutting-edge fire extinguisher training products to workforces in all industries. Our live-fire and advanced digital products keep firefighters ready for action, no matter the location. Together, we prepare fire and safety leaders for whatever comes next .

➔ [LEARN MORE AT LIONPROTECTS.COM/FIRE-SAFETY-TRAINING-TOOLS](https://lionprotects.com/fire-safety-training-tools)