

# Prevention of Fatalities from Ignition of Vapors

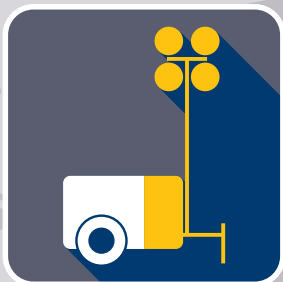
## by Mobile Engines and Auxiliary Motors

Between  
2005 and 2015**85**DEATHS due to fires  
or explosionsincluding  
**27**  
mobile  
engines/motors  
deaths

Vehicles and motorized equipment present an ignition hazard if located too close to the wellbore or other potential flammable vapor sources (e.g., flowback tanks, frac tanks, production tanks). When flammable vapors or gases are released, non-intrinsically safe engines and motors can ignite the vapors and cause explosions with catastrophic consequences. Conducting a Fire Risk Assessment to ensure safe positioning of all motorized equipment during drilling and completions, servicing, and production operations is essential to preventing fires and explosions.



diesel trucks



light plants



motors &amp; pumps

**EVACUATE!**

If an engine “over revs” or  
“runs away,”  
you run away too

## Employers

### Conduct Fire Risk Assessments at the worksite and review with workers, including:

- Train workers to know that when an engine “over revs” or starts “running away,” it’s in a gas/vapor cloud
- Identify potential sources for release of flammable gases or vapors (wellbore, flowback tanks, frac tanks, production tanks)
- Evaluate the location of potential source of release as they relate to on-site ignition sources. Consider changing weather conditions (wind, temperatures, etc.)
- Establish acceptable areas, boundaries, and entry routes for vehicles and motorized equipment, including contractors’ equipment
- Ensure that the location of all vehicles/motorized equipment is within the established areas, boundaries, and entry routes
- Develop a Job Hazard Analysis (JHA) that includes fire risk hazards
- Review the JHA, fire prevention plans, and emergency evacuation procedures at daily shift meetings

**Note: Reference API 54 for Guidance**

### Engineering controls and other preventative measures:

- Monitor (personal and/or fixed) for flammable gases and vapors (e.g., lower explosive limits - LEL) and oxygen
- Consider installing shutdown systems (positive air shut-off for diesel or ignition kill for gasoline), intake flame arrestor, exhaust system spark arrest, or other appropriate protective systems for mobile engines
- Use safe work permit system or other administrative control method to control vehicle/motorized equipment access in areas that could contain flammable vapors and gases
- Train workers on hazards of internal combustion engines as ignition sources **Note: See OSHA Fact Sheet - Internal Combustion Engines as Ignition Sources**
- Shut down running/idling non-essential equipment and vehicles

### Establish safe work practices and procedures:

- Evacuate the area immediately if an engine “over revs” or “runs away”
- Communicate emergency procedures to all employees about what to do if an engine “over revs” and their specific duties during shutdown operations

## Workers

- Follow employer’s safe work practices and procedures
  - Participate in and review JHA before beginning work
- Attend hazard communication training—know the contents and hazards of the equipment you work on
  - Remove other potential ignition sources from hazard zones (e.g., static, cell phones, open flames, cigarettes, sparks from tools or metal objects, etc.)
- Use required PPE, gas detection devices (personal), and **heed all alarms**

If you’re uncertain about potential risks  
or have questions,  
**STOP THE JOB AND ASK —  
IT COULD SAVE YOUR LIFE!**