# *Fuel Handling and Fire Prevention Safe Work Practices*

**Guidelines for Safely Using Chemical Stoves and Lanterns \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Chemical Fuels:** Knowledgeable supervision must be provided when staff are involved in the storage of chemical fuels, the handling of chemical fuels in the filling of stoves or lanterns, or the lighting of chemical fuels. **The use of liquid fuels for starting any type of fire is prohibited.**

1. Have appropriate means of fire suppression ready before igniting appliance—fire extinguisher, sand, water buckets.
2. Operate and maintain according to manufacturer's instructions.
3. Store fuel securely in well-marked containers at least 10 m/33 ft from tents, away from ignition sources, and below 37 °C/99 °F.
4. Let appliances cool before refueling.
5. Refuel a safe distance from ignition sources. No smoking during refueling. Use eye protection. Pour through a filter funnel. Recap both the device and the fuel container before igniting.
6. **Never fuel, ignite, or operate a stove, heater, or lantern in a tent unless tent is expressly designed for such use.**
7. Place the stove on a level, secure surface before operating.
8. When lighting a stove, keep fuel bottles well away. Keep your head and body to one side.
9. Do not leave a lighted stove or lantern unattended.
10. Do not overload the stove with heavy pots or large frying pans.

**Fire Safety around Tents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

No tent material is completely fireproof. It can burn when exposed to continuous intense heat or flames. The most important safeguard is to keep flames away from cloth materials. For this reason, the following safety precautions are emphasized:

1. Only flashlights and electric lanterns are permitted in tents. ***No flames in tents* is a rule that must be enforced.**
2. **Never use liquid-fuel stoves, heaters, lanterns, lighted candles, matches, and other flame sources in or near sleeping tents.** **No smoking in tents.**
3. Do not pitch tents near an open fire.
4. Do not use flammable chemicals near tents—charcoal lighter, spray cans with flammable propellent, insect killer or repellent, analytical chemicals, or specimen fixatives.
5. Store fuel, firearms, ammunition, and other hazardous materials in secure well-labeled containers at a safe distance from sleeping, cooking, and work areas.
6. Be careful when using electricity and lighting in tents.
7. Always extinguish cooking campfires promptly.
8. **Obey all fire laws, ordinances, and regulations.**

**Campfire SOP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* Check for local open-fire bans and regulations regarding campfires.
* Designate a single person to act as Fire Warden, responsible for monitoring the fire and ensuring fire is completely extinguished.
* Use locally obtained fuel. Transporting firewood or kindling to camp can spread pests and plant diseases.
* Make a safe fire site:
  + Use established firepits, previously used campfire rings, or metal fire pan as much as practical.
  + Fire site should be at least 8 m/25 feet from tents and cooking fly, clear of overhanging branches, steep slopes, rotted stumps or logs, dry grass and leaves, and cleared down to mineral soil or built on fire-resistant materials.
  + Ensure a safe path between the main campsite and fire site, suitable for navigation in the dark. Clear the area around the fire ring of tripping hazards.
  + Clear all burnable material within a 1 to 2 m/4 to 6 feet radius of the fireplace or as required by local law.
  + Have bucket of water for extinguishment close by before starting fire.
* Make a safe fire:
  + Keep fire reasonably small to reduce impact, use of firewood, dispersion of embers/sparks, and ashes to be disposed.
  + Watch out for flying embers and sparks, especially in the direction of tents and fuel depot, and when wearing synthetic clothing material.
  + Use especial caution around fire when wearing well-insulated clothing—you may catch on fire and not realize it.
  + Do not leave fire unattended. Beware of changing weather conditions, especially increasing winds.
  + Do not jump over a campfire. Do not throw inappropriate objects into fire (sealed cans, pressurized containers, glass bottles, old boots, etc.).
* Extinguish the fire completely:
  + Sprinkle with water or smother it with mineral soil or sand. Beware of steam burns.
  + Stir thoroughly
  + Sprinkle or smother again.
  + Check that the fire is completely out—Place hand over ashes and partially burned fuel for one minute to verify lack of heat generation.
* Dispose of cold ashes and partially burned fuel appropriately:
  + Use designated fireproof container at established campgrounds.
  + Do not collect ashes and partially burned fuel in a plastic pail.
  + Do not leave a pail with ashes or partially burned fuel against the side of a building or on a wooden deck.
  + Scatter cold ashes and partially burned fuel widely through the surrounding area away from the campsite.

**S****afe Refueling And Fuel Handling Safe Work Practices\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Vehicles:**

* Put vehicle in Park/gear and set brake.
* Turn off vehicle engine.
* Do not smoke or light matches/lighters.
* Do not re-enter vehicle during refueling, but do not leave vehicle unattended.
* When using portable containers, choose a refueling location that is:
  + > 8 m/25 ft away from ignition sources
  + > 60 m/200 ft from surface water sources.
* Place a tarp, drip tray, or small plastic pool under the refueling area and cover with adsorbent pads to prevent ground contamination. Soiled adsorbent pads should be place into sealed plastic bags. Dispose of sealed plastic bags appropriately.
* Have a fire extinguisher and fuel spill cleanup material readily available.
* Wear eye and hand protection.
* If fuel is splashed on skin or clothing:
  + Gasoline is a skin, eye, and respiratory-tract irritant and a CNS depressant in acute exposures. Pulmonary aspiration of even small amounts of ingested gasoline can cause chemical pneumonitis. Systemic effects may also include renal failure, and increased susceptibility to ventricular fibrillation.
  + Victims who are able may assist with their own decontamination. Remove and double-bag contaminated clothing and personal belongings.
  + Flush exposed skin and hair with plain water for 2 to 3 minutes, then wash with mild soap. Rinse thoroughly with water.
  + Irrigate exposed or irritated eyes with plain water or saline for 15 minutes. Remove contact lenses if easily removable without additional trauma to the eye.
  + For more information, see CDC Medical Management Guidelines for Gasoline (2014; https://www.atsdr.cdc.gov/)

**Portable Containers:**

* Use only approved and clearly labeled portable containers.
* **Place container on the ground** when filling. Containers should never be filled while inside a vehicle or the bed of a truck.
* Keep the nozzle in contact with the rim of the container opening while refueling.
* Fill container no more than 95% full to allow for expansion.
* Place cap tightly on container after filling - do not use containers that do not seal properly.
* If fuel spills on the container, make sure that it has evaporated before placing in your vehicle.
* Avoid leaving containers in direct sunlight.
* Ensure portable containers are secured against tipping, sliding, and rattling within vehicle; do not transport fuel containers in roof racks.
* Respect the maximum gross vehicle weight (GVW) when carrying fuel containers. Distribute load evenly between front and rear axles and side to side.

**Fuel Spill Response \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Fuel-spill response plans must address life safety, health, and environmental quality. The details of such plans are subject to regulation and guidance by fire safety and environmental protection agencies, whose guidance is essential to follow.

Plans for small fuel spills (< about 50 gallons) typically involve at least the following steps:

1. As soon as possible, remove/disable all sources of ignition.
2. If possible, contain the spilled fuel and stop the release. Use soil, sand, gravel, straw, kitty litter, or other such materials to contain and/or absorb fuel spills. Wear appropriate PPE.
3. If there is a significant fire hazard, use foam as appropriate. Do not over apply. Minimize the amount of water used on the spill.
4. Recover as much pooled fuel as possible into appropriate containers. Dispose of in a manner appropriate for regulated hazardous waste.
5. Absorb petroleum residues with sand, straw, sawdust, ground corn cobs, or commercial absorbents such as kitty litter or oil dry. Avoid washing residues away with water. Absorbent materials contaminated with spilled fuel must be disposed of appropriately.
6. If washing with water is the chosen option, runoff should be captured in appropriate containers and/or routed to a sanitary sewer with the knowledge and approval of the wastewater treatment plant operator.
7. In certain circumstances, especially where appropriate means of disposing of contaminated absorbents are not available, in-situ bioremediation may be considered, depending on the nature and volume of the spilled material, local soil and weather conditions, and local resources and regulations.
8. Decontaminate personnel, equipment and materials contaminated during the response.
9. Report spill to responsible authorities as required.

NOTE: Life safety is the primary consideration in a response. All of these actions may not be the most appropriate in certain situations. Every response method has its own inherent advantages and disadvantages. Response options must be evaluated and initiated according to the specifics of each spill.

For more information see such resources as Missouri DNR - Division of Environmental Quality, DPS - Division of Fire Safety, 1998, Technical Bulletin 1/1998, PUB000212 as well as US OSHA, Department of Transportation, and National Fire Protection Association websites.

**Fire Suppression in the field\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* **Raise the alarm and call for assistance.**
* **Fight a fire ONLY if small and if a safe escape route is available (in a downhill, upwind direction)**
* **Smother with mineral dirt or fire extinguisher**
* **Remove fuel supply and allow to burn out if safe**
* **Cool fuel with water below ignition point**
* **Never fight a fire involving explosive materials. Retreat to a safe distance and keep all others away from fire.**

If fire breaks out, it must be suppressed quickly and properly. To do this, you must know the three classes of fires and how to combat them:

**Class A**: Fires that involve solids—normal combustible materials such as grass, wood, paper, fabrics, rubber, and many plastics. Quench with water, dirt, tri-class (ABC) chemical or foam extinguishers, or remove fuel by cutting grass and trees (throw into burned area) or dig down to mineral soil.

**Class B:** Fires that involve liquids—gasoline, oil, grease, tars, paints, lacquers, or flammable gases. Cutoff fuel supply and allow to burn out if safe to do. Quench by smothering with tri-class (ABC), regular dry chemical, foam, or carbon dioxide (CO2) extinguishers or mineral dirt. Water is dangerous, as it spreads the fire.

**Class C**: Electrical fires involving heated wire and arcing. These fires must be suppressed with tri-class (ABC) dry chemicals or C02. Never use water, which is a conductor.

Fires in any one class may involve materials of other classes, so more than one type of extinguisher should be available. Extinguishers should normally be mounted near a doorway and approximately at shoulder level in structures, and in the passenger compartment in a vehicle.

* In a camp setting, the Activity Coordinator is responsible for training staff in fire prevention, setting a fire watch for fire detection and reporting, and fire fighting. All participants, local hires, and staff should have fireguard plan training.
* Douse a tent fire with water or sand. If safe to do so, drop the tent by kicking out the end tent poles (most effective with canvas wall tents).

*(after Boy Scouts of America, “Guide to Safe Scouting” and “Unit Fireguard Chart”, and National Fire Protection Association guidelines)*

**Wildfire Safety Standard Operating Procedure: L-A-C-E-S \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**L- Lookout:** Has fire been thoroughly scouted and lookouts posted (if necessary)?

**A- Awareness**: Are all aware of predicted weather, potential fire behavior, safety and field-work plans?

**C- Communications:** Are communications among lookout, base camp, and field team adequate?

**E- Escape Routes**: Have escape routes been identified and understood by all?

**S- Safety Zone**: Have safety zones been identified and understood by all?

SAFETY ZONE: An area clear or cleared of flammable material used for refuge from an approaching wildfire front. The area is large enough to hold all personnel and vehicles at a safe distance from radiant and convected heat without using a fire shelter. A minimum diameter of 16 to 32 times the expected flame height is recommended by wildfire scientists (*e.g., Butler and Cohen, 1998, International Journal of Wildland Fire, v. 8, p. 73-77*). The minimum diameter of this area thus ranges from 15-35 m/50-115 ft in short grasslands to 150-350 m/500-1,150 ft in mixed trees and shrubs.

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**LACES Checklist**

***LACES*** *must be established and known to* ***ALL, BEFORE*** *needed.*

**Lookout(s):**

* Experienced/Competent/Trusted
* Enough lookouts at good vantage points, 24-hour coverage
* Knowledge of field team locations

**Awareness:**

* Escape routes and Safety zones
* Trigger points/conditions for evacuation
* Weather forecast
* Fire potential and behavior
* Daily Action Plan (base camp and field-work)

**Communications:**

* Radio frequencies and communications modes confirmed
* Backup procedures and check-in time established
* Provide updates on any situation change
* Sound alarm early, not late

**Escape Routes:**

* More than one escape route (avoid uphill escape routes)
* Scouted: Hazards such as loose soils/rocks/vegetation
* Timed: Account for Slowest person/Fatigue and Temperature factors
* Marked: Flagged for day or night
* Evaluated: Escape time vs. Potential rate of fire spread
* Vehicles parked for escape

**Safety Zones:**

* Scouted for appropriate size and potential hazards
  + Larger zone needed if upslope, downwind, or in heavy fuel area
* Survivable without a fire shelter
* Back in burned-out area OR
* Natural Features: Rock Areas/Water/Meadows OR
* Constructed Sites: Clearcuts/Ploughed Field/Rice Paddy/Roads
* Base camp pitched in or very near Safety Zone
* Re-evaluate adequacy as fire potential and predicted behavior changes.

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*after Incident Response Pocket Guide (PMS461), 2018; US Bureau of Land Management Risk Management Guidelines.*

**Safe Use of Chemical Stoves and Lanterns SOP – French/Français**

1. Operate and maintain according to manufacturer's instructions.
2. Store fuel securely in well-marked containers at least 10 m from tents, away from ignition sources and below 37 deg C.
3. Let appliances cool before refueling.
4. Refuel a safe distance from ignition sources. Pour through a filter funnel. Recap both the device and the fuel container before igniting.
5. **Never fuel, ignite, or operate a stove, heater, or lantern in a tent.**
6. Place the stove on a level, secure surface before operating.
7. Have appropriate means of fire suppression ready before igniting—fire extinguisher, sand, water buckets.
8. When lighting a stove, keep fuel bottles well away. Keep your head and body to one side.
9. Do not leave a lighted stove or lantern unattended.
10. Do not overload the stovetop with heavy pots or large frying pans.

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**Directives de sécurité pour l'utilisation des fourneaux et lanternes chimiques**

1. Opérez et assurez l'entretien en suivant les directives du fabricant.
2. Stockez le carburant en respectant les principes de sécurité dans des conteneurs correctement identifiés, situés au moins à 10 m des tentes, loin des sources d'allumage et en dessous de 37º C.
3. Laissez les appareils se refroidir avant de refaire le plein.
4. Faites le plein à bonne distance des sources d'allumage. Versez à travers un entonnoir à filtre. Remettez le bouchon sur l'appareil et le récipient de carburant avant l'allumage.
5. **Ne remettez jamais du carburant, n'allumez et ne laissez jamais un fourneau, un appareil de chauffage, ou une lanterne allumée dans une tente.**
6. Placez le fourneau sur une surface plane et solide avant d'opérer.
7. Assurez-vous que vous avez les appareils nécessaires de lutte contre l'incendie à proximité avant d'allumer: Extincteur, sable, seaux d'eau.
8. En allumant un fourneau, assurez-vous que les bouteilles de carburant sont aussi éloignées que possible. Gardez votre tête et votre corps d'un seul côté.
9. Ne laissez pas un fourneau ou une lanterne allumée sans surveillance.
10. N'encombrez pas la surface de cuisson avec de lourdes casseroles ou de grandes poêles à frire.

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**Safe Use of Chemical Stoves and Lanterns** **SOP – Spanish/Español \_\_\_\_\_**

1. Operate and maintain according to manufacturer's instructions.
2. Store fuel securely in well-marked containers at least 10 m from tents, away from ignition sources and below 37 deg C.
3. Let appliances cool before refueling.
4. Refuel a safe distance from ignition sources. Pour through a filter funnel. Recap both the device and the fuel container before igniting.
5. **Never fuel, ignite, or operate a stove, heater, or lantern in a tent.**
6. Place the stove on a level, secure surface before operating.
7. Have appropriate means of fire suppression ready before igniting—fire extinguisher, sand, water buckets.
8. When lighting a stove, keep fuel bottles well away. Keep your head and body to one side.
9. Do not leave a lighted stove or lantern unattended.
10. Do not overload the stovetop with heavy pots or large frying pans.

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**Uso seguro de estufas y linternas químicas**

1. Operar y mantener de acuerdo con las instrucciones del fabricante.
2. Almacene el combustible de forma segura en contenedores bien marcados al menos a 10 m de tiendas de campaña, lejos de fuentes de ignición y por debajo de 37 deg C.
3. Deje que los aparatos se enfríen antes de repostar.
4. Repostar una distancia segura de las fuentes de ignición. Vierta a través de un embudo de filtro.Vuelva a tapar el dispositivo y el contenedor de combustible antes de encender.
5. **Nunca alimente, encienda o opere una estufa, calentador o linterna en una tienda de campaña.**
6. Coloque la estufa en una superficie nivelada y segura antes de operar.
7. Tenga listos los medios apropiados de supresión del fuego antes de encender: extintor de incendios, arena, cubos de agua.
8. Al encender una estufa, mantenga las botellas de combustible bien lejos. Mantenga la cabeza y el cuerpo a un lado.
9. No deje una estufa encendida o una linterna desatendida.
10. Do no sobrecargar la estufa con ollas pesadas o sartenes grandes.

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**S****afe Refueling And Fuel Handling Safe Work Practices SOP – French/Français \_\_**

* Turn off vehicle engine.
* Put vehicle in park/gear and set brake.
* Do not smoke or light matches/lighters.
* Have appropriate means of fire suppression ready before fueling—fire extinguisher, sand, water buckets.
* Do not re-enter vehicle during refueling.
* **Do not overfill the vehicle.**
* Use only approved portable containers and **place it on the ground** when filling. Containers should never be filled while inside a vehicle or the bed of a truck.
* Keep the nozzle in contact with the rim of the container opening while refueling.
* Fill container no more than 95% full to allow for expansion.
* Place cap tightly on container after filling - do not use containers that do not seal properly.
* If fuel spills on the container, make sure that it has evaporated before placing in your vehicle.
* Ensure portable containers are secured against tipping and sliding within vehicle; avoid leaving containers in direct sunlight.

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**Directives de sécurité pour faire le plein et manipuler les carburants**

1. Arrêtez le moteur du véhicule.
2. Mettez le levier de changement de vitesse à "stationnement" et serrez le frein.
3. Ne fumez pas ou n'allumez pas de briquet.
4. Assurez-vous que vous avez les appareils nécessaires de lutte contre l'incendie à proximité avant d'allumer: Extincteur, sable, seaux d'eau.
5. Ne rentrez pas dans la voiture pendant le plein.
6. **Ne faites pas déborder le réservoir du véhicule.**
7. Utilisez seulement les récipients portatifs autorisés et **placez-les par terre** pour les remplir. Ne remplissez jamais les récipients lorsque vous êtes à l'intérieur du véhicule ou à l'arrière d'un camion.
8. Gardez le gicleur en contact avec le rebord de l'ouverture du récipient lorsque vous faites le plein.
9. Ne remplissez pas le récipient à plus de 95% pour tenir compte de l'expansion du fluide.
10. Rebouchez le récipient à fond après le remplissage; n'utilisez pas de récipients qui ferment mal et ne sont pas étanches.
11. Si le carburant se renverse sur le récipient, assurez-vous qu'il s'est évaporé avant de le mettre dans votre véhicule.
12. Assurez-vous que les récipients portatifs ne se renversent pas et ne glissent pas dans le véhicule; évitez de laisser les récipients en plein soleil.

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**Safe Refueling And Fuel Handling Safe Work Practices SOP – Spanish/Español \_**

* Turn off vehicle engine.
* Put vehicle in park/gear and set brake.
* Do not smoke or light matches/lighters.
* Have appropriate means of fire suppression ready before fueling—fire extinguisher, sand, water buckets.
* Do not re-enter vehicle during refueling.
* **Do not overfill the vehicle.**
* Use only approved portable containers and **place it on the ground** when filling. Containers should never be filled while inside a vehicle or the bed of a truck.
* Keep the nozzle in contact with the rim of the container opening while refueling.
* Fill container no more than 95% full to allow for expansion.
* Place cap tightly on container after filling – do not use containers that do not seal properly.
* If fuel spills on the container, make sure that it has evaporated before placing in your vehicle.
* Ensure portable containers are secured against tipping and sliding within vehicle; avoid leaving containers in direct sunlight.

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**Repostaje seguro y manejo de combustible prácticas de trabajo seguras**

1. Apague el motor del vehículo.
2. Coloque el vehículo en el parque/engranaje y ajuste el freno.
3. No ne fume ni encienda fósforos/encendedores.
4. Tener listos los medios apropiados de extinción de incendios antes de alimentar: extintor de incendios, arena, cubos de agua.
5. No vuelva a entrar en el vehículo durante el reabastecimiento de combustible.
6. **No sobrellene el vehículo.**
7. Utilice únicamente recipientes portátiles aprobados y colóquelos en el suelo al llenar.Los contenedores nunca deben llenarse mientras están dentro de un vehículo o en la cama de un camión.
8. Mantenga la boquilla en contacto con el borde de la abertura del recipiente durante el reabastecimiento.
9. Llenar el contenedor no más del 95% lleno para permitir la expansión.
10. Coloque la tapa firmemente sobre el recipiente después del llenado – no utilice recipientes que no sellen correctamente.
11. Si se derrama combustible en el recipiente, asegúrese de que se haya evaporado antes de colocarlo en su vehículo.
12. Asegúrese de que los contenedores portátiles estén asegurados contra la vuelco y el deslizamiento dentro del vehículo; evitar dejar recipientes a la luz solar directa.

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