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Chapter 1 Administration

1.1 Introduction
Fire incidents and loss associated with fire are a major problem in the United States. According to the National Fire Protection Association (NFPA), in the year 2012 structure fires numbered 480,500 resulting in 14,700 injuries, 2,470 deaths, and $9.8 billion in property damage. In Texas, the Texas State Fire Marshal’s Office reported that in the year 2008 structure fires numbered 23,672 resulting in 1162 injuries, 123 deaths, and just over $4.7 million in property loss. It is the responsibility of all faculty, staff, and students at the Texas A&M Health Science Center to become educated in fire prevention practices and do their part to ensure the Health Science Center is an environment safe from fire related emergencies.

1.2 Purpose
The Texas A&M Health Science Center Fire Prevention Code is a document that is to be used as a reference for the Texas A&M Health Science Center (TAMHSC) community for the purpose of assisting with the enforcement of fire and life safety rules and policies. In addition, this document will empower faculty, staff, and students to take responsibility for their personal fire safety and prevention. Finally, this document will help to ensure that the TAMHSC remains in compliance with those fire codes and standards adopted by the Texas State Fire Marshal.

1.3 Scope
The Texas A&M Health Science Center Fire Prevention Code establishes the minimum criteria necessary to provide a reasonable level of fire and life safety from hazards related to fire and similar emergencies.

The scope of this code shall include but not be limited to:
1) Inspection of Texas A&M Health Science Center facilities for compliance with this code and other applicable fire and life safety rules and policies.
2) Review of construction plans for both new and existing facilities related to fire and life safety systems, including fire protection systems.
3) Review of events and activities that may impact fire and life safety, or that may require a permit as described in this code.
4) Fire prevention best practices for the control of fire and related hazards.
5) Fire and life safety education of occupants in TAMHSC facilities.

1.4 Governing Codes and Standards
The Texas A&M Health Science Center is required to comply with those codes and standards that are officially adopted by the Texas State Fire Marshal’s Office (SFMO) for the purpose of inspecting state owned facilities, facilities constructed on state owned property and TAMHSC leased property as deemed appropriate by the SFMO.

The Texas State Fire Marshal’s Office has officially adopted the National Fire Protection Association’s Life Safety Code (NFPA 101), with all reference codes and standards therein.
Referenced codes and standards include but are not limited to:

- NFPA 1  Fire Code
- NFPA 10  Standard for Portable Fire Extinguishers
- NFPA 13  Standard for the Installation of Fire Sprinkler Systems
- NFPA 25  Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems
- NFPA 30  Flammable and Combustible Liquids Code
- NFPA 45  Standard on Fire Protection for Laboratories Using Chemicals
- NFPA 70  National Electric Code
- NFPA 72  National Fire Alarm Code
- NFPA 160  Standard for the Use of Flame Effects Before an Audience
- NFPA 1126  Standard for the Use of Pyrotechnics Before a Proximate Audience

In addition to these codes and standards, this fire prevention code may also reference the International Fire Code, the International Building Code, and other applicable nationally recognized codes and standards as necessary to ensure a reasonable level of fire and life safety.

1.5 Authority

The Texas State Fire Marshal’s Office shall be recognized as the Authority Having Jurisdiction (AHJ), having ultimate authority for the enforcement of governing codes and standards. For the day-to-day enforcement of governing codes and standards, the Texas A&M Health Science Center Fire Marshal shall be recognized as the local Authority Having Jurisdiction.

The TAMHSC Fire Marshal shall have the authority to inspect any building or premises at all reasonable times and shall have the authority to stop work, remove, or correct conditions deemed hazardous or immediately dangerous to life and health.

1.6 Interpretation

The Texas A&M Health Science Center Fire Marshal, as the local Authority Having Jurisdiction, shall be responsible for the interpretation of the Texas A&M Health Science Center Fire Prevention Code and applicable governing codes and standards.

1.7 Permits

Certain types of work, events, and activities require a permit before such work, event, or activity can take place.

Permits are currently required for the following:

1. Hot Work
2. Fire Protection System Impairment Remodel/Renovation
3. Special Events with greater than 50 persons in attendance
4. Erection and Use of Tents
5. Use of Flame Effects or Pyrotechnics
6. Renovation / Construction / Remodeling

Contact TAMHSC Environmental Health & Safety, or visit our [website](#) to acquire the necessary permit application(s).
1.8 Responsibilities
Fire safety is everyone’s responsibility. Those responsibilities specific to the requirements of this fire prevention code are listed below.

1) Environmental Health & Safety shall be responsible for:
   a) The regular inspection of TAMHSC facilities, events, and activities for compliance with governing codes and standards.
   b) Maintaining record of regular inspections, including final disposition of any violations.
   c) Responding to reports of unsafe conditions.
   d) Providing education and training related to fire prevention practices.

2) All faculty, staff, and students shall be responsible for:
   a) Becoming familiar with and understanding fire prevention practices.
   b) Reporting any unsafe conditions.
   c) Their personal fire safety.

Chapter 2 Facility Evacuation

2.1 Facility Evacuation Plans
Every facility or area within leased facilities where TAMHSC personnel are located shall be required to have a written emergency evacuation plan. Each department or facility coordinator shall be responsible for developing and maintaining this plan. These plans will be reviewed by Environmental Health & Safety on an annual basis. An emergency evacuation plan template is available on the EHS website to assist in the development of a plan.

2.2 Reporting a Fire Incident

The following procedures should be followed to report a fire:

- If you discover a fire, evacuate the building immediately.
- Activate the nearest fire alarm pull station on your way out to warn others of the need to evacuate. You can find a fire alarm pull station next to an enclosed exit stair or building exit.
- Once you are outside safely, dial 911 or other emergency phone numbers as appropriate if dialing from another TAMHSC facility phone to summons help. This may be 9-911, or 8-911 etc.
- Provide information requested such as:
  - Building name and address
  - Location of fire
  - Type and size of fire
  - Any injuries etc.
- Remain outside the building until told it is safe to re-enter by emergency response personnel.

If you are trained in the proper use of portable fire extinguishers, and are not in immediate danger, you may choose to try and extinguish the fire. If there is any doubt that you are able to extinguish the fire, evacuate the building immediately following the steps above.
All fires, no matter how big or small, that occur in HSC facilities, involve TAMHSC personnel, or occur on TAMHSC property shall be reported to the TAMHSC Fire Marshal within 24 hours of
occurring. Notification of a fire can be made using an electronic reporting form on the TAMHSC EHS website, or by utilizing the HSC eduSafe mobile app. The facility coordinator and safety representative for your facility should also be notified.

2.3 Evacuation Drills
All TAMHSC facilities shall conduct scheduled evacuation drills to ensure that occupants are familiar with their facility emergency evacuation plan and know what to do in the event of an actual emergency evacuation.

- Drills should be coordinated by the facility coordinator, security personnel, and Environmental Health & Safety.
- Drills should be conducted with an emphasis on orderly evacuation rather than speed.
- Drills should involve all occupants of the facility. Persons may be exempt from evacuating to the exterior of the building if doing so will cause undue hardship, however this is strongly discouraged and notification of such hardship should be communicated to the facility coordinator, safety, or security personnel prior to a drill taking place if at all possible. In such cases the occupant(s) shall simulate what they would do in the event of an evacuation, move to an exit stair and wait for further instruction.
- Drills should be scheduled at least annually.
- Drills should be conducted at both expected and unexpected times and under varying conditions to simulate the unusual conditions that may occur during an actual emergency.
- Drills should be evaluated and a record of the drill shall be maintained for 1 year.

After each drill, an after action review should be held involving all necessary parties to evaluated how well the emergency evacuation plan was followed, and any recommendations for improvement will be disseminated to the occupants of the facility.

Chapter 3 Fire Department Access and Response

3.1 Cooperation with Local Fire Department
The Texas A&M Health Science Center relies on local fire departments to respond to TAMHSC facilities in emergency situations. Cooperation with local fire departments to ensure access to TAMHSC facilities, and the safety of fire fighters when responding to emergencies is imperative to the safety of all faculty, staff and students.

3.1.1 New Construction / Facility Changes
At the discretion of the TAMHSC Fire Marshal, any new construction and/or facility changes that may affect the timely and safe response of fire department personnel shall be communicated to the local fire department Fire Marshal.

3.1.2 Tours and Pre-Planning
Tours of new facilities, and existing facilities where facility changes made may affect the timely and safe response of fire department personnel, shall be scheduled with the local fire department so that each responding shift is given the opportunity to see the layout of the facility. These tours shall include at a minimum, the facility coordinator, and a member of Environmental Health and Safety.
Access to TAMHSC facilities shall be scheduled and made available to local fire department personnel for the purpose of emergency response pre-planning.

3.1.3 Building Identification
All TAMHSC facilities shall be identified on the exterior of the building in a manner that is acceptable to the TAMHSC Fire Marshal and the local fire department, to assist with locating the correct facility in the event of an emergency.

3.2 Knox Box
Facilities equipped with Knox Boxes, shall designate a responsible person(s) to verify the contents of the Knox Box are current on an annual basis.

3.3 Fire Lanes
Fire lanes shall be marked and shall not be obstructed in any manner at any time, including parked vehicles.

Fire lanes shall have a minimum unobstructed width of 20ft and a minimum unobstructed vertical clearance of 13ft 6in. (These minimum clearances may be increased at the request of the local fire department.)

3.4 Fire Hydrants
Fire hydrants shall be provided with a minimum 3ft of clearance from all obstructions.

3.5 Fire Safety Equipment

3.5.1 Access
Access to all fire safety equipment including fire department connections, standpipe connections, fire pumps, fire sprinkler control valves, fire alarm control panels, etc. shall have a minimum 36 inches of clearance from obstructions at all times.

Never cover a smoke detector, hang anything from a fire sprinkler, or otherwise tamper with any fire safety equipment. Any suspicion that this has been done should be reported to the facility coordinator, Environmental Health & Safety or security personnel immediately.

3.5.2 Impairment
Any impairment to fire protection systems shall follow the procedures set forth in the Red Tag Procedures document which utilizes the FM Global tagging system. This document can be found on the TAMHSC Environmental Health & Safety website.

Chapter 4 Construction and Renovation

4.1 Permit
Any construction, renovation, or remodel in existing TAMHSC facilities shall require a permit issued by Environmental Health & Safety in coordination with Facilities, Utilities and Security.
4.2 Plans
Drawings depicting proposed changes shall be submitted to Environmental Health & Safety for review and comment prior to the project commencing. These drawings shall show both existing and proposed layouts of the overall floor plan and the specific area being affected.

4.3 Waste Disposal
Accumulations of combustible waste material, dust, and debris shall be removed at the end of each work shift or more frequently as necessary for safe operations.

Materials susceptible to spontaneous ignition, such as oily rags, shall be placed in a listed disposal container.

4.4 Occupancy during Construction
Facilities, or portions of facilities, shall be permitted to remain occupied only where required means of egress, and required fire safety systems are in place and continuously maintained in the portion being occupied.

4.4.1 Fire Safety Systems
Where fire safety systems must be impaired during a project, such systems shall be returned to service as quickly as possible during the project, and whenever possible returned to service at the end of each day.

Any impairment to fire protection systems shall follow the procedures set forth in the Red Tag Procedures document which utilizes the FM Global tagging system. This document can be found on the TAMHSC Environmental Health & Safety website.

4.5 Emergency Access
Fire department access to facilities and areas within facilities under construction shall be maintained throughout the construction process. This includes fire lanes, fire hydrants, fire department connections, Knox Box, etc.

Chapter 5 Means of Egress

5.1 Means of Egress
A means of egress is a continuous and unobstructed way of travel from any point in a building to a public way consisting of three separate and distinct parts; the exit access, the exit, and the exit discharge.

- Exit access is the portion of a means of egress that leads to an exit.
- An exit is defined as a portion of a means of egress that is separated from all other spaces of a building by construction or equipment as required to provide a protected way of travel to the exit discharge.
- Exit discharge is defined as that portion of a means of egress between the termination of an exit and a public way.

The path to an exit shall be conspicuously marked and exit signs shall be illuminated and continuously maintained.
5.1.1 Doors
Doors serve as a barrier to fire and smoke spread which could reduce the usability of the means of egress in a fire emergency. The following shall apply to doors along the means of egress:

- All fire doors shall be kept in a normally closed position unless they are situated to automatically close upon activation of the fire alarm system.
- Make sure fire doors are not blocked open or that the ability of the door to fully close and latch is impeded.
- Report any damage or apparent modifications to fire doors to the facilities coordinator or Environmental Health & Safety.
- Non-fire rated doors should be kept closed whenever the room or office is unoccupied.

5.1.2 Corridors
Corridors serve as the primary exit access component to safely reach an exit and shall be kept free of storage and other items that have the potential to interfere with the safe egress of occupants.

5.1.3 Stairs
Enclosed exit stairs serve as the protected path to the exit discharge. It is vitally important that these stairways remain completely clear of storage and other items at all times and are in a condition of full and immediate use in the event of an emergency evacuation.

5.1.4 Exit Discharge
In order to evacuate occupants safely away from a building in an emergency, the area outside an exit must be kept clear and unobstructed at all times. Items such as landscaping, bike racks, and storage shall not be placed outside of exits where they have the potential to block or impede the safe egress of occupants.

Chapter 6 Fire Prevention

6.1 General Fire Safety Practices
Fire safety is everyone’s responsibility and your personal fire safety begins with you. It is important for you to be aware of your environment and identify potentially unsafe situations. The following are some general fire safety practices that you can put into action to help ensure a fire safe workplace.

6.1.1 Inspecting Your Own Area
You are your department’s best fire inspector. Knowing what to look for and being vigilant about keeping your area fire safe will help to ensure your safety as well as those around you.

Fire requires certain elements in order to start and maintain combustion. There must be a fuel source, ignition source, and sufficient oxygen to produce a chain reaction capable of sustaining fire.

Fire can be prevented by removing one of these elements. Keeping fuel sources such as combustible and flammable items away from ignition sources such as heat or electrical are good fire safety practices to help prevent fires from starting.
Annex A provides a quick self-inspection checklist of items that you can look for when inspecting your area for potential fire hazards.

6.1.2 Good Housekeeping
Good fire safety practice begins with good housekeeping. The accumulation of combustible items, such as loose or shredded papers, magazines, and journals presents a high risk fuel source for fire and is prohibited. Quantities of combustible items shall be kept to a minimum and stored in a neat and orderly fashion. Unneeded and unnecessary items should be removed and disposed of properly on a regular basis.

6.1.3 Storage of Combustible Materials
Whenever it is necessary to store combustible materials, the following shall apply:
- Storage shall be kept neat and orderly.
- Storage shall be separated by distance or shielding from ignition sources such as heat producing equipment and electrical.
- Storage shall be kept a minimum of 24 inches from the ceiling in areas without fire sprinklers.
- Storage shall be kept a minimum of 18 inches below fire sprinkler deflectors in areas having fire sprinklers.
- Storage shall not be placed in a means of egress or exit enclosure.
- Storage shall not be permitted in mechanical or electrical rooms.
- Storage outside of buildings shall not be within 10 feet of the building or building exits.

6.1.4 Decorations
Decorating our offices and buildings can be fun and often helps to provide for a more pleasant work environment. Decorations should:
- Not block or interfere with access to or identification of an exit.
- Not obstruct fire safety devices, such as fire extinguishers, smoke detectors, and fire sprinklers.
- Never be hung from fire sprinklers or piping.
- Shall be labeled or identified by the manufacturer as fire retardant if made of combustible material.
- Should not be attached to or cover the ceiling in a way that will provide for rapid fire growth.

6.1.4.1 Holiday Decorations
In addition to those requirements listed above, the following shall apply to holiday decorations:
- Live cut Christmas trees are prohibited inside TAMHSC buildings unless specifically permitted by the TAMHSC Fire Marshal.
- All artificial trees shall be labeled or identified or certified by manufacturer as fire retardant.
- If metal trees are used, lights shall not be permitted to be placed on the tree.
- Lights should never be stapled or tacked.
• All electrical decorations must be listed or labeled by Factory Mutual (FM) or Underwriter’s Laboratory (UL).
• Avoid the use of extension cords. If extension cords are used, they should be in plain sight and unplugged at the end of each day.
• Do not leave lights on in an area that is unoccupied.

6.1.5 Bulletin Boards, Posters, and Paper
Bulletin boards, posters and paper attached directly to the wall shall not exceed 20 percent of the aggregate wall area to which they are applied.

6.2 Appliances
Appliances include but are not limited to: computers, copiers, refrigerators/freezers, space heaters, microwaves, or any other device used for a particular purpose and powered by electricity or some alternative fuel source such as gas. The following shall apply to the use of appliances:
• Only use appliances that are FM or UL listed or labeled.
• Provide adequate space around appliances per the manufacturer’s recommendation to allow for proper air circulation and prevent overheating.
• Plug large appliances such as refrigerators and freezers directly into a wall outlet.
• Check electrical cords on a regular basis for cracked insulation, and to ensure that the plug is completely recessed into a receptacle.
• If an appliance begins to spark, produce an electrical burning odor or smoke, turn the appliance off immediately and discontinue use.

6.2.1 Clothes Dryers
• Clothes dryers shall have lint traps cleaned after each use.
• The area behind and around the dryer shall be inspected for lint buildup on a regular basis and the lint shall be removed.

6.2.2 Space Heaters
• Space heaters are prohibited within TAMHSC buildings.
• Submit a work order to have office temperature adjusted.

6.2.3 Portable Generators
• Portable generators shall not be operated or refueled inside buildings, on balconies, or roofs.
• Refueling shall only be permitted from a container when the generator is shut down and the engine temperature is below the auto-ignition temperature of the fuel.
• Exhaust from portable generators shall be directed in such a manner that it is at least 5 feet away from a building and any openings or air intakes.
6.3 Cooking
Cooking in HSC facilities shall comply with the following:
- Cooking shall only take place in designated kitchens and break areas where the proper cooking related equipment is located and available.
- Portable cooking devices may be used only if they are electrically powered.
- Portable cooking devices that produce grease vapors are prohibited.
- If cooking is involved as part of an event that will take place outside a kitchen or designated break area, those planning the event shall contact Environmental Health & Safety personnel prior to the event for approval.

6.4 Candles
Candles or similar devices that have an open flame or smolder are regulated by the TAMHSC Standard Administrative Procedure “Use of Candles”.

6.5 Smoking
In accordance with HSC Rule 34.05.99.71 smoking is prohibited in all HSC facilities, at entrances to HSC facilities, and in all HSC vehicles rather leased or owned.

6.6 Electrical
Electricity can be an ignition source of fire. The following fire safety practices will help prevent these types of fires:
- All electrical installations must be in accordance with NFPA 70. Altered electrical equipment, cords, etc. are prohibited.
- Routinely inspect electrical cords for missing or broken prongs, cracked insulation, and fraying.
- Check to be sure that electrical cords are not pinched by furniture or equipment.
- Do not use electrical cords that are damp or wet unless approved for such use.
- Report any damage to plugs, switches, etc. immediately to facilities or safety personnel.
- Electrical cord connections to outlets shall be visible for inspection to ensure plugs are fully recessed into the outlet.
- Electrical equipment not in use shall be turned off and unplugged.

6.6.1 Extension Cords
- Do not run extension cords under carpeting, through doorways, or above ceilings.
- Extension cords shall not be used as a substitute for permanent wiring. Permanent wiring shall be defined as a normal 8 hour work day. If work requires a permanent power source, contact facilities personnel to inquire about adding a permanent power source near your work.
- Extension cords shall not be bundled when in use.
- Extension cords shall not be plugged into other extension cords.

6.6.2 Multiple Adapters, Power Strips (Surge Protectors)
- Multiple adapters shall be of the surge protector type with an internal breaker.
- Multiple adapters and power strips with surge protection shall be plugged directly into a wall outlet.
- Do not plug a power strip into another power strip.
6.6.3 Electrical Panel Boxes
- Electrical panel doors shall be kept closed and latched.
- Electrical blank covers shall be installed where breakers are missing.
- A minimum 3 feet of clearance shall be maintained in front of electrical panels. Hinged doors shall open at least to 90 degrees, and clear space shall extend from the floor to 6 ½ feet or height of equipment, whichever is greater.

6.7 Fire and Smoke Spread
One of the best methods of preventing a fire from growing should it occur is through containment. Certain features of fire protection such as ceiling membranes, fire rated partitions and walls, and fire doors help to contain fire to the location of origin. The following shall be required to aid in the prevention of fire and smoke spread:
- Penetrations that must be made in fire rated partitions and walls shall be properly sealed with an approved fire rated assembly.
- Fire and smoke dampers shall be kept clear of all obstructions.
- Ceiling tiles shall be maintained in position and replaced when damaged.
- Fire doors shall remain in the closed position unless held open by a device that allows the door to close automatically upon activation of the fire alarm system.

6.8 Flammable and Combustible Liquids
Flammable liquids are defined as any liquid having a closed cup flashpoint below 100 degrees Fahrenheit. Some examples of flammable liquids include: Acetone, Dimethyl Ether, Ethanol, Diethyl Ether, Gasoline, Kerosene, and Methanol.

Combustible liquids are defined as any liquid having a closed cup flashpoint above 100 degrees Fahrenheit. Some examples of combustible liquids include: diesel, paint thinner, cooking oils, and motor oils.

The flashpoint is the lowest temperature at which vapors will ignite in air when exposed to an ignition source. Possible ignition sources that should be considered and controlled when working with and around flammable and combustible liquids include: open flames, hot surfaces, radiant heat, smoking, cutting and welding, sparks, static electricity, heat producing equipment and appliances.

6.8.1 Working with Flammable and Combustible Liquids
- Whenever possible, flammable and combustible liquids should be replaced by safer less flammable and combustible materials to reduce the risk of fire.
- Work should be carried out in a well-ventilated and exhausted area.
- Use only flammable and combustible liquid safety cans of a capacity not greater than 5 gallons.
- Limit the amount of liquid being used to only that which is needed for the operation at hand.
- For liquids that can form a static electrical charge such as xylene, toluene, benzene, and gasoline, it is prudent to bond metal dispensing and receiving containers together before pouring to prevent a spark from igniting the vapors.
- If a spill occurs, limit the spread of the liquid by using an appropriate absorbent material and cover the liquid with the material to limit vapor release. Notify
Environmental Health & Safety personnel and begin clean-up and proper disposal.

6.8.2 Storage of Flammable and Combustible Liquids
As a general rule, the following requirements for the storage of flammable and combustible liquids shall apply. For specific situations, contact Environmental Health & Safety.

- Flammable and combustible liquids shall be stored in safety cans not to exceed a capacity of 5 gallons.
- A maximum of 10 gallons may be stored outside of a flammable storage cabinet.
- Quantities in excess of 10 gallons must be stored in an approved flammable storage cabinet.
- The total amount of liquid in a storage cabinet shall not exceed 120 gallons.
- Flammable and combustible liquids shall not be stored with incompatible materials such as oxidizers and organic peroxides.
- All containers and storage cabinets shall be conspicuously labeled
  - WARNING: FLAMMABLE-KEEP FIRE AWAY.

6.9 Compressed Gases
The following shall be required when working with compressed gases:

- Inspect cylinders for damage, leaks, defects, rusting, etc. on a regular basis and prior to accepting delivery of cylinders. If any damage is noted, turn off the gas and stop using the cylinder. Notify Environmental Health & Safety.
- Valves shall remain closed except when containers are connected to closed systems and ready for use.
- Cylinders shall be kept in an upright position.
- Cylinders shall be secured from accidental dislodgement by an approved means.
- Protective caps shall be in place whenever the cylinder is not in use.
- Cylinders and rooms where cylinders are in use shall be identified with the proper label or signage.
- Compressed gases should be used in well-ventilated or continuously exhausted areas. Depending on density of gases, exhaust may be required at the floor, ceiling, or both.
- Cylinders shall not obstruct exit access.
- Cylinders shall maintain a minimum 10 feet clearance to combustibles.
- Cylinders shall not be exposed to temperatures exceeding 125 degrees Fahrenheit.
- Cylinders should be placed away from electrical outlets.
- Cylinders shall be separated from incompatibles by a minimum of 20 feet.

Where Gas Cabinets are required or in use, they shall meet the following requirements:

- Cabinets shall be exhausted and ventilation must operate at a negative pressure relative to the surrounding area.
- The velocity at the face of access ports or windows shall not be less than 200 feet per minute average with windows open.
- Access to controls shall be by self-closing limited access port or noncombustible window.
- Cabinet shall be equipped with self-closing door.
- Where containing toxic, highly toxic, or pyrophoric gases, the cabinet shall be internally
protected by fire sprinklers.

For material specific requirements including corrosive, flammable, oxidizing, pyrophoric, toxic and highly toxic gases, contact Environmental Health & Safety.

6.10 Liquefied Petroleum Gas
Liquefied Petroleum Gas (LPG) is extremely flammable and its sale and use is regulated by several different agencies. The following requirements shall be followed when working with LPG:

- LPG shall be used in a well-ventilated area.
- LPG shall not be stored near heat, flame, or other ignition sources.
- LPG containers shall be inspected regularly for denting, bulging, corrosion, and cracked or deteriorating hoses. Containers displaying any of these conditions shall be removed from service.
- LPG containers shall be appropriately labeled as Flammable and as LPG, Propane, or Butane.
- LPG cylinder shall not be stored near exits or areas intended for egress.
- Quantities in excess of 2 pounds shall not be stored inside a building.
- Quantities in excess of 2 pounds shall be stored outside in a lockable ventilated enclosure of metal construction and shall be at least 10 feet away from any building opening.

6.11 Hot Work
Any work involving open flames, or that produces heat and/or sparks shall require a Hot Work Permit before work can be started. This may include such work related to brazing, cutting, grinding, soldering, torch applied roofing, and welding.

Hot work procedures and permit application can be found on the TAMHSC Environmental Health & Safety website.

Chapter 7 Laboratories Using Chemicals

This section shall apply to laboratory buildings, laboratory units, and laboratory work areas in which chemicals are handled or stored. These requirements are in addition to all other requirements stated elsewhere in this code.

7.1 Means of Egress
All laboratories shall have at least two exits under the following conditions:

- The laboratory contains an explosion hazard.
- The laboratory work area exceeds 1000 square feet.
- A hood in a laboratory work area is located adjacent to the primary exit.
- A compressed gas cylinder larger than lecture size (approximately 2 inches X 13 inches) is located where it may prevent safe egress in the event of accidental release.
- A cryogenic container is located where it may prevent safe egress in the event of an accidental release.
7.2 Handling of Chemicals
- Class I liquids shall not be transferred from one container to another in an exit access corridor.
- Chemicals being used shall be maintained at the lowest possible quantity necessary for the work being performed.
- Handling and storage shall conform to the manufacturer’s recommendations and the Safety Data Sheet (SDS).

7.3 Storage of Chemicals
- Inventories of chemicals in use and storage shall be maintained.
- Maximum allowable quantities are reduced by 25 and 50 percent when laboratories are located above the fourth and sixth floors respectively.
- Incompatible materials shall be segregated.
- Class I flammable liquids and Class II combustible liquids not in use shall be stored in safety cans, and in approved storage cabinets.
- Containers of materials that may become hazardous over time shall be dated when first opened and properly managed.
- Chemicals shall not be stored inside a fume hood.

7.4 Chemical Waste
Waste containers stored in laboratories shall not exceed 5 gallons.

7.5 Flammable and Combustible Liquids
The maximum allowable container size for flammable and combustible liquids shall be in accordance with NFPA 45 Table 10.1.2.

<table>
<thead>
<tr>
<th>Container Type</th>
<th>IA</th>
<th>IB</th>
<th>IC</th>
<th>IIA</th>
<th>IIIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>500 mL (1 pt)</td>
<td>1 L (1 qt)</td>
<td>4 L (1 gal)</td>
<td>4 L (1 gal)</td>
<td>20 L (5 gal)</td>
</tr>
<tr>
<td>Metal (other than DOT drums) or</td>
<td>4 L (1 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
</tr>
<tr>
<td>approved plastic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety cans</td>
<td>10 L (2.6 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
</tr>
<tr>
<td>Metal container (DOT specification)</td>
<td>4 L (1 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
</tr>
<tr>
<td>Polyethylene (DOT Specification 34,</td>
<td>4 L (1 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
<td>20 L (5 gal)</td>
</tr>
<tr>
<td>UN 1H1, or as authorized by DOT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>special permit)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressurized liquid dispensing</td>
<td>20 L (5 gal)</td>
<td>227 L (60 gal)</td>
<td>227 L (60 gal)</td>
<td>227 L (60 gal)</td>
<td>227 L (60 gal)</td>
</tr>
<tr>
<td>container</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: This table is based on Table 6.2.3 of NFPA 30, Flammable and Combustible Liquids Code, except for allowable quantities of flammable liquids in metal (DOT specification) drums and pressurized liquid dispensing containers.

aSee 6.1.1 for definitions of the various classes of flammable and combustible liquids.

bSee 10.1.2(1) and A 10.1.2.

cSee 10.1.2(2).
The maximum allowable quantities of flammable and combustible liquids shall be in accordance with NFPA 45 Table 10.1.1(a) for metric units and (b) for standard units.

Table 10.1.1(a) Maximum Quantities of Flammable and Combustible Liquids in Laboratory Units Outside of Inside Liquid Storage Areas (Metric)

<table>
<thead>
<tr>
<th>Laboratory Unit Fire Hazard Class</th>
<th>Flammable and Combustible Liquid Class</th>
<th>Quantities in Use&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Quantities in Use and Storage&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Maximum Quantity&lt;sup&gt;b&lt;/sup&gt; per 9.3 m² of Laboratory Unit</td>
<td>Maximum Quantity&lt;sup&gt;b&lt;/sup&gt; per Laboratory Unit</td>
</tr>
<tr>
<td>A</td>
<td>I, II, and IIIA</td>
<td>38</td>
<td>1820</td>
</tr>
<tr>
<td></td>
<td>I, II, and III</td>
<td>76</td>
<td>3028</td>
</tr>
<tr>
<td>B&lt;sup&gt;d&lt;/sup&gt;</td>
<td>I, II, and IIIA</td>
<td>20</td>
<td>1136</td>
</tr>
<tr>
<td></td>
<td>I, II, and IIIA</td>
<td>38</td>
<td>1515</td>
</tr>
<tr>
<td>C&lt;sup&gt;e&lt;/sup&gt;</td>
<td>I, II, and IIIA</td>
<td>7.5</td>
<td>570</td>
</tr>
<tr>
<td></td>
<td>I, II, and IIIA</td>
<td>15</td>
<td>787</td>
</tr>
<tr>
<td>D&lt;sup&gt;f&lt;/sup&gt;</td>
<td>I, II, and IIIA</td>
<td>4</td>
<td>264</td>
</tr>
<tr>
<td></td>
<td>I, II, and IIIA</td>
<td>4</td>
<td>264</td>
</tr>
</tbody>
</table>

<sup>Note: For maximum container sizes, see Table 10.1.2.</sup>
<sup>*The maximum amount in use in open systems is limited to 10 percent of the quantities listed.</sup>
<sup>See 4.2.2 for additional requirements for educational and institutional laboratories.</sup>
<sup>The quantities per 9.3 m² do not apply if the quantities must be within that 9.3 m² area; the quantities per 9.3 m² are for calculation purposes to determine the total quantity allowed per laboratory work area and the total amount overall in the laboratory unit.</sup>
<sup>Reduce quantities by 60 percent for B laboratory units located above the 3rd floor.</sup>
<sup>Reduce quantities by 25 percent for C and D laboratory units located on the 4th-6th floors of a building and reduce quantities by 50 percent for C and D laboratory units located above the 6th floor.**
7.5.1 Dispensing of Liquids

- Containers of Class I liquids smaller than 5 gallons shall be dispensed inside a chemical fume hood or in an area provided with ventilation adequate to prevent the accumulation of vapors from exceeding 25 percent of the lower flammability limit of the liquid.
- For containers larger than 5 gallons, dispensing shall take place outside the building.
- Class I containers that exceed 1 gallon capacity shall be electrically interconnected by direct bonding or by indirect bonding through a common grounding system when transferring liquid from one container to another.

7.5.2 Equipment

- When stored in refrigerated equipment, flammable liquid containers shall be closed.
- Refrigerators, freezers, and other cooling equipment shall be labeled to indicate that they meet the requirements for safe storage of flammable liquids.
- Only heating equipment such as ovens, furnaces, and environmental chambers that are intrinsically safe shall be used to heat, store, or test flammable and combustible liquids or aerosols containing flammable gases.
- Heating equipment shall have an over-temperature shut-off switch.
- When baths are used to heat flammable and combustible liquids to their flash points, they shall be placed in a chemical fume hood or shall be vented to a safe location to control vapors.
- Baths shall be made of only noncombustible materials.
7.6 Compressed Gases

- Cylinders not in use shall not be stored inside a laboratory unit.
- Cylinders shall be equipped with a pressure regulator specific to the gas and marked for its maximum pressure.
- Cylinders shall have a manual shut-off valve.
- Quantities of compressed gases shall be in accordance with the most current editions of NFPA 45 and NFPA 55.
- For guidance, contact Environmental Health & Safety.

Chapter 8 Fire Protection Equipment

8.1 Fire Extinguishers

Portable fire extinguishers can be used to extinguish small contained fires. It is important to know where fire extinguishers are located and how to properly use a fire extinguisher.

Portable fire extinguishers should be maintained in a conspicuous location, along normal paths of travel where they are visible and readily accessible.

Portable fire extinguishers shall be securely mounted on a hanger intended for fire extinguishers or in a fire extinguisher cabinet.

Portable fire extinguishers shall be inspected monthly and a record of the inspection maintained.

Portable fire extinguishers shall only be used on the class of fire for which they have been designed. The following is a list of fire classification:

- Class A: Fire involving ordinary combustible items such as wood, paper, plastic.
- Class B: Fire involving flammable and combustible liquids.
- Class C: Fire involving energized electrical equipment or appliances.
- Class D: Fire involving combustible metals, such as magnesium and titanium.
- Class K: Fire involving cooking oils such as those used in a deep fryer.

The type of fire extinguisher used directly corresponds with the class of fire to be extinguished. The extinguisher type is printed on the fire extinguisher’s label. The following is an explanation of the different fire extinguisher types:

- Class A fire extinguisher: used to extinguish Class A fires and generally contain only water and compressed air. Do not use a Class A extinguisher on any other type of fire.
- Class B and Class C fire extinguishers: used to extinguish Class B and Class C fires and generally contain carbon dioxide as an extinguishing agent.
- Class D fire extinguishers: used to extinguish Class D fires, and generally contain a sodium chloride based dry powder extinguishing agent.
- Class K fire extinguisher: used to extinguish Class K fires and generally contain a wet chemical agent that extinguishes the fire through saponification.

A common fire extinguisher often seen is the ABC Dry Chemical fire extinguisher which can be used on Class A, B, C fires.
8.1.1 Using a Portable Fire Extinguisher
When using a portable fire extinguisher, it is important to remember a few basic rules:

- Only use a portable fire extinguisher if you have received the proper training.
- Only use a portable fire extinguisher if you feel you are not in immediate danger.
- Only use a portable fire extinguisher on small contained fires.
- Never place a fire between you and an exit.
- Never turn your back on a fire.

Remember the P.A.S.S. Method when using a portable fire extinguisher:

- P – Pull the pin
- A – Aim at the base of the fire
- S – Squeeze the trigger
- S – Sweep in a back and forth motion at the base of the fire

Report any use or accidental discharge of a fire extinguisher immediately to Environmental Health & Safety.

Hands-on fire extinguisher training can be scheduled through Environmental Health & Safety.

8.2 Fire Alarm, Detection, and Sprinklers
Fire alarm and detection devices provide for early warning of a fire situation to give occupants as much time as possible to evacuate a facility.

Fire sprinklers help to suppress a fire once it has started to help with preventing the fire from growing and give emergency responders more time to reach the fire and extinguish it.

Tampering with such devices or obstructing them from view and ready access can have severe consequences.

Be cognizant of your surroundings and do not block or otherwise impede the quick access and response of these life safety devices.
ANNEX A

Fire & Life Safety Self-Inspection Checklist

1. MEANS OF EGRESS:
   ___ No storage in exit corridors / exit stairways
   ___ Exit doors locked during working hours
   ___ Exits not properly marked
   ___ Exit lights not working properly or damaged

2. ELECTRICAL:
   ___ Electrical cord(s) present tripping hazard
   ___ Extension cords used as permanent wiring (plugged in for longer than a normal 8hr day)
   ___ Extension cords cracked, broken insulation, missing ground
   ___ Cover plates missing

3. STORAGE OF MATERIALS:
   ___ Storage within 18 inches of sprinkler heads
   ___ Storage within 24 inches of ceilings
   ___ Storage in mechanical rooms / electrical closets
   ___ Flammable liquids stored improperly
   ___ Storage of combustible materials near open flame / heat source

4. FIRE PROTECTION EQUIPMENT:
   ___ Fire extinguishers damaged
   ___ Fire extinguishers blocked
   ___ Fire hose cabinet blocked / damaged

5. FIRE ALARM, DETECTION, SPRINKLERS:
   ___ Fire safety equipment not accessible
   ___ Manual pull alarms blocked / damaged
   ___ Smoke / heat detectors damaged / obstructed
   ___ Sprinkler valves not accessible
   ___ Items hung from fire sprinklers

6. FIRE AND SMOKE SPREAD:
   ___ Ceiling tiles missing / not in place
   ___ Fire doors blocked open

7. HAZARD CONTROL:
   ___ Slip or trip hazards
   ___ Evidence of smoking in building
   ___ General housekeeping needed