THE UNIVERSITY OF TENNESSEE
HEALTH SCIENCE CENTER

| UT Health Science Center:<br>FS5300 – Fire Prevention Plan | |
|---|---|
| **Version 1** | **Publication Date: 06/14/2022** |

| **No./Title: FS5300– Fire Prevention Plan** | **Resp. Office: Campus Safety and Emergency Management** | **Effective Date: 6/30/2017** |
|---|---|---|
| **Category: General Safety** | **Last Review: New** | **Next Review: 6/30/2020** |
| **Contact: Scott Adams, Fire Safety Coordinator** | ☎ 901.448.5619 | ✉ eadams22@uthsc.edu |
| **Related Policies:**<br>UT System Safety Policy SA0100<br>UT System Safety Policy SA0700 | UTHSC FS5301<br>UTHSC FS5302<br>UTHSC FS5303 | UTHSC GS5100 |
| **Forms:** | | |

## PURPOSE, SCOPE, AND APPLICABILITY

The University of Tennessee Health Science Center (UTHSC) Fire Prevention and Safety Plan (FPP) is a document that sets fire safety standards for practices, policies, and procedures to facilitate the University community's ability to conduct safe operations and to ensure regulatory compliance. The purpose of the Plan is to provide standards to safeguard life, health, property, and public welfare by monitoring and controlling the design, construction, quality of materials, occupancy use, location and maintenance of all buildings, and structures within the campus community. The Plan includes methods designed to protect employees, students, and guests from fire and safety hazards presented by diverse operations conducted at the University and to promote safe practices.

Under this plan, faculty, staff, and students will be informed of the plan's purpose, preferred means of reporting fires and other emergencies, types of evacuations to be used in various emergency situations, and the alarm system(s). The plan is closely tied to our Building Emergency Action Plans (BEAP) where procedures are described for emergency escape route assignments, accounting for all employees after emergency evacuation has been completed, and rescue and medical duties for those employees who perform them.

The Fire Prevention Plan meets the fire prevention and safety requirements outlined in the Occupational Safety and Health Act (OSHA), 29 CFR 1910.39, which encompass the uniform codes and nationally recognized codes and standards. The Plan is to simplify and address the most common fire and safety compliance issues in the above mentioned codes and standards.

The objective of the Plan is to provide one comprehensive fire prevention and safety document for the campus community to reference in order to ensure safe practices are implemented in each University operation, as well as construction operations and special events conducted on University property or University-related functions on non-University property. The provisions of the Plan apply to construction, alteration, moving, demolition, repair, maintenance and use

of any building or structure. The University is a complex environment and warrants a Plan to provide special and specific guidance for public assembly areas, classrooms, laboratories, restaurants, industrial operations, repair shops, and warehouses. University Facilities Department, and Campus Safety are responsible, along with any architect or engineer, to enforce and comply with all requirements of OSHA, and the State of Tennessee code or ensure compliance with the intent of the code. The Tennessee State Fire Marshal's Office/UTHSC Fire Safety Officer is responsible for enforcing all requirements of the International Fire Code—2012 edition (or latest edition) and the National Fire Protection Association (NFPA).

The Fire Prevention Plan applies to all University employees, functions, and affiliations. In addition, the University has the following plans, compliance guidelines, and programs established to protect the University community from health hazards:

- UTHSC Hazard Communication "Employee Right-To-Know" Program (applies to all employees)
- UTHSC Chemical Hygiene Plan (applies to employees engaged in the laboratory use of hazardous chemicals)
- UTHSC Regulated Medical Waste Policy (HW5201)
- UTHSC Exposure Control Plan for Bloodborne Pathogens (applies to employees determined to have potential exposure to human blood and other potentially infectious materials as mandated by OSHA)
- UTHSC Campus Safety and UTHSC Research Safety Compliance Guidelines

## ABBREVIATIONS, ACRONYMS AND DEFINITIONS:

1. **ADA:** Americans with Disabilities Act
2. **BEAP:** Building Emergency Action Plan
3. **CAMPUS SAFETY:** Director, Campus Safety and Emergency Management and staff
4. **CLASS A SYSTEM:** Class A and B circuits apply to both initiating (pull stations, smoke detectors, etc) and indicating devices (horns, speakers, strobes). Both types are specifically detailed in NFPA 72. Essentially Class A is a loop, and Class B is run out to the last device.
5. **ICC/IFC:** International Code Council/International Fire Code
6. **IBC:** International Building Code
7. **IMC:** International Mechanical Code
8. **FPP:** Fire Prevention Plan
9. **OSHA**: Occupational Health and Safety Administration
10. **NAFED:** National Association of Fire Equipment Distributors

11. **NFPA:** National Fire Protection Association
12. **PFE: Portable Fire Extinguishers**
13. **RESEARCH SAFETY:** Director, Research Safety and staff
14. **SFMO**: State Fire Marshal's Office
15. **UNSAFE BUILDINGS:** The definition of what may constitute as unsafe use is when a building or area of a building creates a hazard to safety, health, or public welfare by reason of inadequate maintenance, dilapidation, obsolescence, fire hazard, disaster, damage, or abandonment.
16. **UTHSC FSO**: University of Tennessee Health Science Center Fire Safety Officer
17. **UTHSC PD**: University of Tennessee Health Science Center Police Department

## RESPONSIBILITES:

**All UTHSC Employees shall:**

a) Employees (any University-paid person, including students) are responsible for understanding the hazards involved with their occupation. They must be familiar with all safety precautions, location and use of fire protection and safety equipment, and know the emergency evacuation plan for their area and be able to demonstrate knowledge of evacuation plan.

b) Managers and supervisors are responsible for ensuring all UTHSC fire and safety policies and evacuation plans are implemented, and all staff is aware and trained on the policies and evacuation plan. The policies and evacuation plan must be specific to their operation and comply with the FPP and all applicable codes.

c) Deans, directors, and chairs are responsible for ensuring that a fire and safety policy and evacuation plan is established for their organization. The fire and safety policy and evacuation plan must be specific to their operation to ensure compliance with the Plan and all applicable codes, as well as ensuring all staff receives adequate fire and safety training.

**Campus Safety and Emergency Management shall:**

a) **Campus Safety** - is responsible for promoting regulatory compliance with State and OSHA standards for UTHSC. Campus Safety will serve as the custodian of all documents required by the Plan, e.g., the 2012 edition and the latest edition/revision of the International Building Code (IBC), International Mechanical Code (IMC), IFC, and NFPA. An organizational chart defining the area of Campus Safety responsibilities along with other safety information can be obtained by contacting Campus Safety and Emergency Management directly.

b) **UTHSC Fire Safety Officer and staff** - The UTHSC FSO, under direction of Campus Safety, manages the fire inspection program, plans review program, fire safety training program, special events review, fire/accident investigation, general safety, monitoring the fire protection testing and maintenance programs, hazard mitigation program, Inter Governmental Agreements (IGA), correspondence/liaison with the regulators—State, Federal, and local, and provides consultations and technical support for the University community.

**Contractors and Subcontractors shall:**

a) Ensure that a fully qualified Fire Safety Plan/Program is in effect with the contractor/sub-contractor organization, when applicable. The program must meet, at a minimum, the provisions of UTHSC's FPP.
   i. The program is the responsibility of the Contractor and Subcontractors, individually. If a contractor sub-contracts to complete the work, then the Contractor is responsible for verification and compliance of the FPP/Program of the subcontractor.
b) Ensure full adherence to UTHSC's policies.
c) Provide appropriate personal protective equipment or other hazard control measures appropriate with work being conducted
d) Provide certifications of training when applicable, and requested.
e) Ensure that his or her employees are appropriately trained and authorized.
f) Ensure that a safety briefing has been completed prior to any work initiated, with all personnel involved including applicable University staff.

## INTRODUCTION:

There have been many studies related to injuries, deaths and property loss due to fire which has introduced many life safety improvements through advance technology and research. Although the United States is one of the most technologically advanced nations we continue to experience a higher life and property loss than most nations. The universities and colleges in the United States are no exception, especially the residential facilities (dormitories, sororities, fraternities, and individual housing units).

Campus Safety, Research Safety, UTHSC Facilities Department, State Fire Marshal's Office and Municipalities (Building and Fire Departments/Development Services) constantly collaborates, evaluates and plans life safety improvements for existing facilities and new construction.

Occupants should be aware of the fire protection features of their building and be careful not to undermine their purpose. Occupants should also practice fire safe behaviors by identifying hazards specific to their area and use the appropriate preventative measures. When a fire occurs, the campus fire emergency procedures should be enacted.

**Life safety is the primary objective of all UTHSC fire protection programs.**

## INSPECTIONS:

The primary purpose of fire prevention planning is to prevent fires from starting. Fire prevention procedures are for preventing, detecting and extinguishing fires. Fire prevention starts with identifying the fire hazards.

Campus Safety Fire Safety Division conducts regularly scheduled inspections of all facilities on and off-campus, as well as special inspections for construction projects, childcare facilities, health-care facilities, and acceptance tests and inspections. Acceptance tests of fire protection systems are jointly inspected and tested by the Tennessee State Fire Marshal's Office and UTHSC FSO.

Campus Safety has a database program that maintains all fire safety documentation and reports (e.g., fire/safety inspection report, follow-up inspection reports, incident investigations). Every fire inspection, follow-up inspection, fire drill, test, or incident investigation conducted by the FSO will be entered into the database, a report generated. Facilities are inspected periodically by scheduling a predetermined number of buildings each month. Each month the buildings are prioritized by the type of occupancy (residential life safety, high occupancy, and high value high rise facilities are of the utmost priority). The FSO is responsible for ensuring that all code and safety issues are addressed appropriately and a response memorandum (providing a status of each line item written on the inspection report) is mailed back to the Tennessee State Fire Marshal's office, when requested, prior to the follow-up inspection due date.

Although the jurisdiction resides with the FSO and the SFMO, the Local Fire Department may conduct pre-fire planning and familiarization inspections of University facilities. Any safety hazards discovered by the Memphis City Fire Department must be directed to the FSO or the State Fire Marshal's Office.

**Self-Inspections:**

A self-inspection program is a program designed for the employee to be actively involved in the safety of their area and facility. Campus Safety encourages all departments to have a fire and safety self-inspection program to ensure the facility is safe and that any safety hazards can be identified and mitigated appropriately.

This program addresses the following issues:

- Fire hazards and proper handling and storage procedures
- Potential ignition sources for fires and their control procedures

Any UTHSC entity that is interested in starting a self-inspection program, please contact the FSO. If you start this program, it is highly recommended to conduct monthly inspections of your area of responsibility. A copy of the completed inspection form should be sent to the University Fire Safety Officer.

## BUILDINGS OR STRUCTURES:

**Unsafe Buildings or Structures:**
Any building or structure or portion of a building or structure that is structurally unsafe, not provided with adequate egress, constitutes a fire hazard or identified as dangerous to human life is prohibited for use or occupancy and declared a public nuisance. Any building or area of a building that are declared to be a public nuisance must be abated by repair, rehabilitation, or removal in accordance with the procedures set forth in the International Code for the Abatement of Dangerous Buildings.

> *Violations:* It is unlawful for any person, department, unit, organization, or corporation to erect, construct, enlarge, alter, repair, move, improve, convert, demolish, equip, use, occupy, or maintain any building or structure or cause or permit a violation of any applicable codes or standards.

**Modifications:**
When there are practical difficulties involved in carrying out the provisions of this document or any other applicable codes or standards—Campus Safety, Facilities Administration, and the SFMO may grant modifications for individual cases, as long as the intent and purpose of the code is maintained and stipulations are adhered to. Modifications cannot lessen any fire-protection requirements or structural integrity. Any variation to the code must be documented and maintained in the facility or project file of Campus Safety, and Facilities Administration.

Variances to the IFC or IBC must be submitted and approved by the SFMO prior to construction phase.

**Plans Review Process:**
The University must comply with applicable building and fire codes for temporary and permanent changes of a building, area of a building, or temporary structure. Capital Programs Management, Application Building and Remodeling Permits and Inspections, and Floor Covering Permit Standards and Procedures ensures the appropriate departments review proposed remodel and construction projects and compliance issues. It is the responsibility of each department or unit to ensure this permit process is accomplished and approved prior to engaging in any remodel or construction project. However, it is important to know all code issues cannot be assured in plans review, thus the reason inspections are performed to help ensure remodels and construction projects are compliant with applicable codes as well as to ensure that the project is accomplished in a safe manner.

**Certificate of Occupancy:**
No building or portion of a building will be used or occupied without being issued a Certificate of Occupancy by Facilities Administration or designated Inspectors (for construction/renovation facilities) or Fire/Safety Inspection Report from the SFMO or by Campus Safety (for any instances other than construction/ renovation related).

Changes in use of a building must be approved by Campus Safety and Facilities Administration. A temporary Certificate of Occupancy may be granted—provided all life safety systems required are certified operational by the FSO and the SFMO and there are no substantial hazards that will result from occupancy of any building or portion thereof before the same project is completed.

**Building and Area Use (Type of Occupancy):**
Buildings and areas within buildings are specifically designed to meet the requirements of a certain type of occupancy. Requirements of a code or standard are implemented once an occupancy type has been established. Occupancy types are classified by a group and division (refer to the IBC, Chapter 3 or IFC for division breakdown).

Each occupancy group has specific construction requirements and life safety system requirements that must be met and maintained. It is important that the occupancy use of an area or building maintains both the construction and life safety criteria and to submit for approval any occupancy changes to Campus Safety and Facilities Administration to ensure

regulatory compliance and to ensure a safe environment is maintained for the University community.

**Occupant Load:**
Occupant loads of a building, an area, or portion of a building are established and enforced to ensure accessibility, building security, and to accommodate safe egress from a building, an area, or portion of a building. An occupant load is determined after establishing the occupancy use and the contents of the building or area of the building. Most assembly areas on campus have the occupant load posted at the entrance of the area or the occupant load is established by the number of fixed seats in the area. The occupant load is calculated by dividing the usable square footage floor space by an occupant load factor. The occupant load factor is determined by the occupancy use. It is important to ensure that the occupant load is established and enforced for accommodating safe egress of occupants.

The IBC and IFC provide the minimum egress requirements and the maximum occupant load criteria/calculations; however, the IBC or IFC may have other requirements that are more restrictive. It is the responsibility of each department, organization, or group to ensure that minimum egress requirements are established and enforced.

Campus Safety and Facilities Administration assists the University community in establishing occupant load limits to ensure egress of occupants are adequately accommodated.

**Guardrails:**
Guardrails are required for unenclosed floor and roof openings, open and glazed sides of stairways, landings and ramps, balconies or porches which are more than 30 inches above grade or floor below, and roofs used for other than service of the building. Some exceptions include the loading side of loading docks, the auditorium side of a stage, and along vehicle service pits not accessible to the public. Guardrails must not be less than 42 inches in height and have intermediate rails or an ornamental pattern such that a sphere 4 inches in diameter cannot pass through. For employee areas only, guardrails are required with a top and mid rail but the 4-inch rule does not apply.

For more specific requirements and exceptions, see IBC Section 1024 and OSHA**.**

**EXIT:**
The term “exit” is defined in IBC as a continuous and unobstructed means of egress to a public way and will include intervening aisles, doors, doorways, gates, corridors, exterior exit balconies, ramps, stairways, pressurized enclosures, horizontal exits, exit passageways, exit

courts and yards. Basically, the exit includes any occupied area of a building continuing on until the occupant safely exits the building.

Exits must be maintained as a safe system for egress. In addition, exits must be maintained as a safe area for rescue assistance for the physically challenged in above or below grade levels. The most common safety hazard is within the corridor.

The fire code restricts the use, storage, or display of any combustible material within a corridor unless it is shielded with a transparent noncombustible material or fire retardant treated, and does not obstruct the required exit width. Contact Campus Safety for information concerning FSO, or SFMO directives or exceptions. It is the responsibility of each department, organization, or group to ensure that the "exit" is continuous and unobstructed, as well as ensuring compliance of fire code issues.

Authorization of any type of storage or use of any "exit" can be temporarily approved by submitting a request to Campus Safety (level of fire protection, construction type, occupancy type, and occupant loads are some factors that are assessed before any variation or authorization is granted).

The specifics on exit width and height, travel distances to an exit discharge, separation requirements, and aisle requirements are provided in IBC and IFC, Means of Egress. Determining the exit widths and fire protection requirements depend on the construction type, type of occupancy, occupant load, type of seating, type of fire detection and suppression that exists in the building, and the longevity of the occupancy type.

> *Vehicles and EXIT Ingress/Egress:* All building exit doors, especially the main entry/exit, must be clear of any vehicles. Whenever possible, service vehicles should park in the service vehicle parking space, the nearest road, or nearest loading zone parking space.
>
> *Vehicles and Pedestrian Areas:* UTHSC walkways, malls or other such areas are designed for pedestrian traffic but accommodate authorized vehicle traffic in certain areas and circumstances. Authorized vehicles are: UTHSC owned/leased and operated, approved vendors, UTHSC Police Department and other emergency response vehicles.
>
> Temporary approval may be granted for special events provided they do not obstruct emergency vehicle access per IFC specifications with Local Fire Department (LFD) adjustments. All drivers using these areas must park their vehicles in a manner that will maintain a minimum access width of 24 feet (26 feet if fire hydrants are on both sides of

the location or areas a ladder truck is needed for setup for emergencies) and a minimum height clearance of 14 feet (per IFC & LFD requirements). All sides of University buildings must be accessible, where possible, for emergency response vehicles/personnel within 150 feet or less.

**Seating and Aisle Spacing:**

There are many variables in determining seating arrangements: the number of seats in a row, the number of rows in a section, spacing requirements between seating, spacing of aisles, and spacing of cross aisles. To ensure compliance of IBC and assist departments and organizations with seating and aisle requirements, Campus Safety is providing the following guidelines that will comply with most situations for public assembly areas.

1. Chair seating must be a minimum of 33 inches from back to back
2. The most protruding back part of a row must not be any closer than 22 inches from the most protruding front part of the row behind it
3. Minimum aisle space between rows will be between 4-8 feet, depending on the type of event, arrangement of seating, and occupant loads
4. Travel distance to an exit must not exceed 150 feet for non-sprinkled buildings and 200 feet for sprinkled buildings (other conditions could increase the travel distance to a maximum of 300 feet)
5. Dead-end vertical aisles for temporary seating must not exceed 26 rows
6. All loose seating (e.g., folding chairs) must be braced together as one row, in a manner that will keep the row together during an emergency egress
7. Accommodations for Americans with Disabilities Act (ADA) must be adequately addressed. Contact Office of Equity and Diversity for compliance information relating to ADA

If you are not able to comply with every item above, contact the FSO for further information and approval of alternate seating and aisle accommodations.

**Fire Alarm Systems and Suppression Systems:**

All University facilities are required to have, at minimum, a manual fire alarm system and all systems must be wired as a Class "A" system (exception: an approved variance by the FSO and SFMO). Determining the requirements of fire protection systems depends mostly on the occupancy type and type of construction. See the IBC and IFC for specific requirements for fire alarm systems and fire-extinguishing systems, and NFPA for specific installation requirements.

Halon Systems, Halon Alternative Systems, Carbon Dioxide Systems, and Dry or Wet Chemical Systems are special suppression systems and they must be maintained in accordance with NFPA Standards. All special systems are required to be tested semiannually by NAFED or other nationally recognized authorized and trained personnel (may require SFMO review and approval). It is the responsibility of the FSO, in conjunction with University Departments, to ensure that all special systems are maintained and tested in accordance with NFPA.

The FSO must maintain the maintenance and testing documents for a minimum of five years.

**Standpipes:**

Standpipe systems may be required in facilities to accommodate fire department suppression activities (standpipes can be wet or dry systems). The following are the three classifications of standpipes which include the City of Memphis Fire Department's specification requirements for standpipes (note: The City Memphis may have requirements that are different than national standard):

- Class I standpipe: A system with 2 ½ inch outlets.
- Class II standpipe: A system with 1 ½ inch outlets equipped with fire hose connected to a water supply.
- Class III standpipe: A system with a 2 ½ inch outlet or 1 ½ and 2 ½ inch outlets directly connected to a water supply and equipped with fire hose on the 1 ½ outlets.

*Note:* As per variance approval by the SFMO, fire hose may be removed once obsolete, replacement required, or testing required as long as stipulations in the variance are assured.

**Fire Extinguishers:**

An accessible travel distance to an appropriate fire extinguisher is required for all areas of operation (Maximum travel distance depends on the nature of the occupancy). Hazardous occupancies must have an accessible fire extinguisher within 30 or 50 feet (based on the occupancy/hazard). Non-hazardous areas must have an accessible fire extinguisher within 75 feet. (Travel distance cannot include locked doors or changes in elevation.)

The following are five classes of fires that any person should be aware of in order to select the proper fire extinguisher for capability of extinguishment.

- Class A: Wood, Paper, Plastic (Ordinary combustibles)
- Class B: Combustible and Flammable Liquids
- Class C: Energized Electrical Equipment (Usually a Class A or B once electrical equipment is de-energized)

- Class D: Combustible and Flammable Metals
- Class K: Kitchen Hood Suppression Systems and Fire Extinguishers Using K Products

To minimize the confusion of selecting the appropriate fire extinguisher on campus, the University has installed multipurpose dry chemical (ABC rated) fire extinguishers in all areas requiring a fire extinguisher with the exception of the following areas:

- Special hazard areas requiring a Class D fire extinguisher (quantity of hazard dictates the need of a class D fire extinguisher)
- Kitchens with commercial hoods require Class BC rated dry chemical fire extinguishers or Class K (depending on the type of hood system)
- Equipment, Mechanical, and Electrical Rooms require Class BC rated dry chemical fire extinguishers

The University is required by OSHA to offer fire extinguisher training classes to all employees. Training classes are offered on a regular basis but special department classes can be set up by calling the FSO. More detail, and types of training are located in the UTHSC Portable Fire Extinguisher Policy (UTHSC FS5302).

Some department operations on campus are more likely to have a fire or incident occur. For this reason, Campus Safety requires that all employees that work within the following areas attend a fire extinguisher training class:

- high risk areas, welding, use of open flames, hazardous chemicals, flammable and combustible liquids and gases, or have an increased probability of fire

Identification of specific departments/personnel that are required to attend fire extinguisher training are located in the UTHSC Portable Fire Extinguisher Policy (UTHSC FS5302).

**Campus Evacuation Procedures:**
The BEAP is an evacuation plan created by, and can be obtained through, Campus Safety. Each facility on campus should have an BEAP in addition to business continuity plans. The evacuation plan and procedures are to be developed and implemented with a collaborated effort by the department and building occupants. Some key items that must be in the evacuation plan are as follows**:**

- Clearly identify responsibilities of occupants to assist in evacuation procedures (activation of building fire alarm system, call 911, provide any information pertaining to the fire or emergency to the emergency responders)
- General Safety precautions (closing doors, understanding and use of life safety protection equipment—including fire extinguishers)
- Evacuation procedures (emergency notification protocol and evacuation plan)
- Designate safe area to reassemble
- Establish accountability procedures and responsibility
- Address issues related to evacuation of physically challenged
- Responsibilities of advising the on-scene emergency responder of vital information related to the emergency.
- Type of Fire Protection Systems
- Number of Exits
- Types of Exits and Travel Distance to each Exit
- Occupant Load
- Coordination with all Occupants
- Alternative reassemble areas for accountability

For assistance in reviewing and implementing an evacuation plan contact Campus Safety.

**General Safety:**

Safety precautions and prohibitions are necessary to ensure a safe environment for employees, visitors, and for the occupants that live and work in residential facilities. Campus Safety and the SFMO prohibit the following items or practices on state property:

- Trees or any other vegetation that is no longer living (i.e., cut Christmas trees, palm fronds—exceptions: flowers as long as maintained fresh per florist's recommendations)
- Candles or Open Burning (approvals through Campus Safety will be required)
- Storage of Class I Liquids in basements (SFO, SFMO review and approval is required)
- Use of extension cords (see electric safety section, and UTHSC Policy GS5100) for authorized use and specifications of extension cords)
- Smoking is prohibited on UTHSC property within 25 feet of all entrances by policy, and state regulation. Additionally, fire code restricts any open flames or smoking due to hazardous chemicals or materials use, storage, handling, or dispensing, including perimeter of campus properties where they are present.

- Obstructing, tampering with, or misusing fire detection and fire suppression systems and their devices
- Storage in corridors and stairways, within 18 inches of fire sprinkler heads or within 24 inches from ceiling on non-fire sprinkled buildings, within 24 inches of smoke or heat detectors, in mechanical rooms, electrical rooms, and exits. (Only temporary authorization can be approved by the Campus Safety FSO)
- Bicycles, skateboard, smart boards, scooters, and non-ADA non-pedestrian manual or motorized modes of transportation in public/UTHSC buildings
- Vehicles or any gas powered equipment used or stored inside buildings (exception: temporary approval may be granted by Campus Safety for special events)
- Battery charging inside buildings (exception: batteries that are completely sealed and do not emit any gases while recharging or when authorized by Campus Safety)

**Electrical Safety:**
To ensure that electrical work in buildings is installed in accordance with the National Electric Code (NEC) and to protect the University and the University community, only journeyman electricians and licensed/bonded contractors are authorized to perform electrical work on campus buildings and equipment.

Any electrical equipment or outlets that are near a water source or exposed to outside weather conditions must be on a Ground Fault Circuit Interrupter (GFCI) system to prevent shock and comply with NEC. All electrical equipment and appliances must be tested and approved for use by a nationally recognized testing laboratory, i.e., Underwriters Laboratory (UL), Factory Mutual (FM).

It is the user's responsibility to ensure that all electrical equipment and appliances are approved by a nationally recognized testing laboratory, inspected prior to use for any damage, repaired or discarded if damaged, and that equipment and appliances are used as recommended by the manufacturer.

The University has general safety requirements for use of electrical equipment or devices in University buildings and prohibits the use of any electrical equipment or devices that are not in compliance University policies, building/fire code and the national electric code. Below are general requirements.

> *Extension or flexible cord specifications (temporary use only):* Specific requirements can be found in UTHSC Policy GS5100, Electrical Safety.

- Minimum of 16 gauge with ground (three pronged male end)
- The cord and both ends (male and female) must be intact with no damage--fraying or exposed wiring
- Only use extension cords or electrical cords in the same room/area (prohibited for use through walls, doorways, ceilings, floors or running under carpets)
- Use of extension cords for permanent wiring (extension cords are for temporary use and must meet the specifications above; limit use to 90 days or less)
- Devices or extension cords that increase outlet capacity (only surge protectors with individual circuit breakers are authorized)

**Storage:**

Storage is a necessity for day-to-day operations; however, improper storage and unauthorized storage creates a fire hazard and may violate fire code. All building occupants must observe and comply with the following in regards to storage:

- Storage must be maintained in an orderly manner
- Loose storage must be kept off floors
- Loose papers, magazines, books, or files must be either put into boxes, stored in filing cabinets, or stacked in an organized manner on shelves
- Excessive amounts of combustible materials, storage, or debris must not be permitted to accumulate in the building
- Storage of any chemicals, flammables, combustibles (liquids, solids, or gases) must be approved and permitted by Campus Safety or Research Safety, in conjunction with the Campus Safety FSO.
- Storage of any material must not obstruct an exit (see exit definition under Exit section), obstruct any fire protection equipment or devices, or obstruct the view of exit signs
- Ensure appropriate aisle width and head clearance is maintained
- A minimum of 18 inches' clearance from the deflector of a fire sprinkler head is maintained and a minimum of 24 inches from the ceiling of non-fire sprinkled buildings
- Storage of Class I Liquids or any other materials that create a toxic or flammable hazard where the material's vapor density is heavier than air is prohibited in basements
- Bicycles, skateboard, smart boards, scooters, and non-ADA non-pedestrian manual or motorized modes of transportation are prohibited in public/UTHSC buildings or any place that obstructs egress from a building or area of a building

- Storage under stairways is prohibited (variances must be reviewed and approved by the Campus Safety)
- Combustible materials must be segregated from flammable and oxidizing materials.
- Any chemical, flammable, or combustible material must be separated and stored (when required) in approved cabinets. (See safe handling and storage of peroxides below).

**Flammable and Combustible Liquids**

Flammable and combustible liquids require special consideration for storage, handling, and dispensing. Some key issues important for compliance and protection to human health are as follows:

- Spill control, drainage control, and secondary containment. All buildings, rooms, and areas must provide a means to control spillage and to contain or drain spillage and fire protection water in accordance with IBC and IFC
- All areas storing, handling, or dispensing Class I Liquids must comply with storage requirements set forth in IFC and comply with the electrical requirements of the NEC
- All areas must comply with the exempt amounts in the IBC and IFC tables or special conditions of a controlled area (variances must be approved by the SFMO)
- All Class I liquids must be stored in grade level or above locations (not permitted in basements or below grade level locations without SFMO, and FSO review and approval)

All Class I and II liquids require storage within an appropriate cabinet (flammable or combustible). Class III liquids may require storage within an appropriate cabinet (decision is based on the quantity, hazards within the area, type of occupancy, and factors involved with mixed occupancies). Occupancy Classifications are found in Chapter 3 of the IBC.

> *Exception:* Groups A, B, E, F, I, M, R, and S Occupancies, the combined total quantities of flammable and combustible liquids used for demonstration, treatment and laboratory work not exceeding 10 gallons (37.85 L) may be authorized without cabinets but must be in approved locations.

Occupancy quantity limits of stored flammable or combustible liquids must not exceed the following:

- Quantities in Group A, B, E, F, I, M, and S Occupancies must not exceed amounts necessary for demonstration, treatment, laboratory work, maintenance purposes, and operation of equipment and must not exceed quantities set forth in IFC
- Quantities in Group R Occupancies must not exceed amounts necessary for maintenance purposes and operation of equipment and must not exceed quantities set forth in IFC

*Bonding and Grounding:* Static protection is necessary in order to prevent a fire or explosion from occurring. Bonding and grounding is a necessary precaution and required when dispensing any Class I, II, and III-A Liquids. The basic concept is ensuring that two or more items where a transfer of a liquid will occur must be connected to the ground and to each other. More specific requirements are in IFC or contact the FSO.

**Special Events:**

Special events are defined as any event that is not of normal occurrence and involves the University staff, faculty, students, or general public. All special events on University property or involving University personnel must have a special event coordinator submit a request to Campus Safety to review, approve, and provide recommendations to address any code issues, safety issues, and insurance issues.

All requests will be reviewed for safety, emergency management, and fire code compliance and the event coordinator will be contacted with an approval, rejection, or special condition approval with stipulations to meet the intent of applicable codes, policies and guidelines.

Detailed information pertaining to Special Events are located in UTHSC Policy EM5401, Special Events.

**Permits:**

Permits are required by Campus Safety for the following:

- Special Events
- Fireworks or Pyrotechnics
- Open flames or open burning
- Storage of chemicals over the IBC/IFC exempt amounts or if considered a controlled area
- Any condition, operation, or use of materials considered being hazardous, dangerous, or unsafe

- Hot Work Operations
  - Hot work must comply with UTHSC Policy FS5303 and associated policy and guidelines.
- Hot Work Operations in confined spaces, requires a confined space permit.

NOTE: Laboratories, research, and other similar buildings or areas within buildings, must have permission to operate, store, and use hazardous chemicals—this is permitted through a Research Safety laboratory certification program. Contact Research Safety for details.

**Safe Handling and Storage of Peroxides and Peroxide Forming Chemicals**

Peroxides are compounds containing 0-0 bonds with an oxidation state of –1. Hydrogen peroxide (H2O2) and its organic peroxide derivatives are intrinsically unstable substances that spontaneously decompose under normal conditions. Special precautions must be taken when using peroxides due to their explosive nature and sensitivity to shock, friction, sparks, and heat. Alkali (group IA) and alkaline (group IIA) metals combine with oxygen to produce metallic peroxides. They are primarily oxidizer hazards; however, metallic peroxides are also water reactive compounds. Metallic peroxides decompose when heated to form oxygen, which supports combustion.

*Hazard Awareness and Recognition:* Common compounds known to form peroxides include, but are not limited to the following*:*

- Ethers, especially cyclic ether and those containing primary and secondary alkyl groups, including dioxane, tetrahydrofuran, diisopropyl ether
- Aldehydes
- Compounds containing benzylic hydrogen atoms, particularly if the hydrogen is on a tertiary carbon such as isopropylbenzene
- Compounds containing allylic hydrogens, including most alkenes, cyclohexene, cyclooctane
- Vinyl and vinylidene compounds, such as vinyl acetate
- Alkali and alkaline metals

*Storage:* Organo-peroxides should be isolated from all other compounds, especially flammables and combustibles. Ideally, they should be stored away from heat, ignition sources, and light in a temperature-regulated, ventilated cabinet. Due to their unstable nature, peroxides should never be stored in bulk unless extremely diluted. Polyethylene

bottles are recommended for storing peroxides and superoxides, and should be capped to release oxygen gas. Metallic peroxides should always be protected from moisture.

Peroxides and peroxide forming compounds have a limited shelf life and should be purchased in small quantities. Each container should be labeled with the date of receipt and the date first opened; however, containers of ether should never be stored for more than twelve months, even if the bottle has never been opened.

*Handling:* Containers of peroxide forming compounds should be handled with care or not handled at all if any of the following pertain: it is of uncertain age, has formed a precipitate, or its physical properties (color, appearance) differ from those of the pure substance. Some of the most commonly available organic-peroxides are toxic by inhalation, ingestion, and skin absorption, and almost all are eye irritants. Always consult the accompanying Safety Data Sheet (SDS) prior to handling any chemical.

*Testing and Stabilizing:* Once a sealed container of a peroxide forming compound is opened, the risk of peroxide formation is inevitable; however, some manufacturers add oxidation inhibitors, such as hydroquinone, to some peroxide forming chemicals. To prevent the decomposition of most forms of hydrogen peroxides, regardless of their concentration, a small amount of sodium pyrophosphate can be used as a stabilizer. This will only slow down the rate of decomposition but will not prevent it. Several testing methods for the presence of peroxides are acceptable. For guidance, please contact EH&S. Test strips for the detection of peroxides are also commercially available.

*Disposal:* Please contact the Campus Safety Hazardous Waste division for the disposal of all chemicals

**Lamps and Light Bulb Hazards:**

The United States Consumer Product Safety Commission has solicited an advisory concerning fires related to lamps, specifically halogen lamps. The NFPA provides information on fires, injuries and fatalities related to lamps and light bulbs. The leading cause of these fires was combustible material located too close to the heat source, which accounted for roughly one-third of the lamp and light bulb fires.

The following safety tips are recommended practices for the University community to ensure a safer community and help preserve life and property:

- Keep combustible materials away from lamps and light bulbs, such as piling linens too near a bulb. (Nothing should be stacked, rested against, or placed on top of a lamp)
- Wall lamps should not be set too near curtains, furniture, or any other material including other walls
- Make sure the lamp cord is protected by an insulated bushing or grommet where the power cord enters the lamp to prevent abrasion
- Do not place cloth over a light bulb to diffuse or soften the light. (Buying low wattage or soft white or pastel light bulbs can help you achieve this effect without creating a fire hazard)
- Read and follow the recommended use and safety precautions recommended by the manufacturer
- Use only light bulbs equal to or less than that for which the light fixture is rated. (Using a higher rated bulb can cause overheating and deterioration of the conductor insulation as well as an ignition source to nearby combustibles). Campus Safety recommends using 60 watt or less light bulbs but not to exceed the appliance capacity.
- Check for loose connections
- Any damage, loose wiring, or any other potential safety hazard must be repaired by a qualified person or the appliance discarded
- Purchase lamps that have been listed by a recognized testing laboratory such as Underwriters Laboratory (UL)
- Due to the higher heat emitting concerns of halogen lamps, Campus Safety recommends if utilizing halogen lamps to have covered bulbs, or replace halogen lamps with 60 watt incandescent lamps. (Exception: exterior security lighting or in open foyers of buildings where exposure to combustible material is not present)

Remember: Lamps and light bulbs themselves do not cause fires but improper use or unsafe practices do! Any questions, please contact Campus Safety or Facilities Maintenance Electricians.

## ATTACHMENTS:

- None

## ASSOCIATED STANDARDS:

- National Electric Code
- OSHA, 29 CFR 1910.37 - Means of Egress
- OSHA, 29 CFR 1910.38, Emergency Action Plans
- OSHA, 29 CFR 1910.101 - Hazardous Materials
- OSHA, 29 CFR 1910.106 - Flammable & Combustible Liquids
- OSHA, 29 CFR 1910.157, Portable Fire Extinguishers
- OSHA, 29 CFR 1910.159 - Automatic Sprinkler Systems
- OSHA, 29 CFR 1926.352, Fire prevention
- NFPA 10, Standard for Portable Fire Extinguishers
- NFPA 101, Life Safety Code
- OSHA, 29 CFR 1910.39, Fire Prevention Plans
- International Code Council/International Fire Code, 2012/2015