

# Carnegie Mellon University

## Environmental Health & Safety

FIRE | LAB | WORK



## **FIRE SAFETY PROGRAM**

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## 1 Environmental Health and Safety Mission

The mission of Environmental Health and Safety (EHS) is to support the University's mission and values by sustaining and enhancing a safe and healthy environment for the Carnegie Mellon University community. The service excellence plus one approach and collaborative partnerships help mitigate the risk of injury, reduce impact to the environment, and maintain compliance within the areas of Fire, Laboratory, and Workplace Safety.

In support of this mission and in accordance with the Environmental Health and Safety Authorization Policy (updated June 2019), EHS has established a Fire Safety Program that defines the goals, framework, and services provided by the Fire Safety Team.

## 2 Fire Safety Program Goals

The goal of a Fire Safety Program is to mitigate the risk of fire that has the potential to result in property damage and personal injury. This is achieved through:

- Compliance with applicable fire safety codes, standards, and regulations.
- Providing fire safety education and training.
- Performing assessments of compliance and program effectiveness.
- Identifying and implementing process improvement opportunities.

## 3 Fire Safety Program Purpose/Scope/Objectives

The safety of the CMU community is a top priority of the university. As such, the university is committed to ensuring an environment and culture of safety through the Fire Safety Program.

The purpose of the program is to demonstrate fire safety compliance and best practices that protect the university community from the risk of personal injury and property damage resulting from fire.

The scope of the program applies to all owned CMU Pittsburgh campus buildings. Elements of this program may be applicable to leased buildings/spaces based upon those lease agreements.

The objective of the program is to outline the services provided by the Fire Safety Team.

#### 4 EHS Fire Safety Services

The Fire Safety Team is responsible for providing fire safety services in support of this program, and serves as a resource for the CMU community which includes, but is not limited to:

- Identify materials that are potential fire hazards; provide guidance and subject matter expertise on housekeeping best practices, and proper handling and storage procedures for flammable and combustible materials;
- Provide fire safety training and education;
- Develop, maintain, and publish fire safety guidelines and procedures;
- Develop and maintain an inventory of fire protection equipment and/or systems and identify departments responsible for maintenance and testing;
- Facilitate and oversee building evacuation drills and record results;
- Issue permits that enable contractors and facilities management staff to perform hot work, roof torching, and fire alarm/protection impairment;
- Collaborate with University Police and Insurance Services for building(s) that require a fire watch;
- Provide subject matter expertise and oversight in the design phase of construction and renovation projects to ensure compliance with applicable fire safety codes, standards, and regulations; and
- Conduct fire safety inspections of campus buildings, providing findings and recommendations to Facilities Management and Campus Services (FMCS) for correction and/or future capital project investment.

#### 5 Identifying Potential Fire Hazards

The Fire Safety Team conducts periodic fire and life safety surveys to evaluate public areas including hallways, stairwells, conference rooms, classrooms, storage areas, and mechanical rooms. The goal of the survey is to look for unsafe practices, poor housekeeping, and conditions related to fire codes and life safety that may

contribute to a fire or deter from effective evacuation of a building in case of an emergency.

Common fire hazards include:

- Unapproved storage in hallways and stairwells
- Blocked emergency exits
- Propped open fire doors
- Permanent use of extension cords
- Overloaded receptacles
- Improper disposal of trash
- Improper storage of chemicals

#### 5.1 Proper Handling and Storage Procedures for Flammable and Combustible Materials

Combustible materials shall be separated from other hazardous materials such as flammables, corrosives, explosives, oxidizers, etc.

Storage areas shall be separated from other areas by at least a one-hour fire barrier with a fire rated self-closing door and be protected by fire detection and/or suppression systems.

Stored materials shall be kept at least 36 inches from any heat source.

Aisles in storage rooms should have a minimum width of 28 inches to allow for evacuation and permit firefighters to gain access to the most remote area of the room.

Storage should not block fire extinguishers, fire alarm pull stations, emergency or exit lighting, access to evacuation routes, exit doors, emergency equipment or prevent entry of emergency personnel.

Storage under stairs is not permitted unless the area is enclosed and protected with a suppression system.

Doors to storage rooms may not be "propped" open at any time.

Smoking is not permitted in any storage area under any conditions.

Rooms used for flammable storage should be constructed to meet the requirements for at least one-hour fire rating, ventilation, heating, electrical systems, fire detection, and/or suppression systems.

Flammables should be stored in an approved flammable materials storage cabinet. The cabinet should be labeled and incorporate self-closing doors.

Flammable storage should be kept at least 50 feet from open flames or other heat sources.

Oily or grease-laden rags should be placed in a self-closing oily rag can for proper cleaning or disposal.

Ordinary combustibles may not be stored in flammable storage cabinets.

## 5.2 Disposal

For the transportation and disposal of hazardous waste accumulations so that they do not contribute to a fire emergency, the university community should follow the Hazardous Waste Management Services Guidelines posted on the EHS web site and notify EHS. For universal waste disposal, the community should contact FMCS.

## 6 Fire Safety Education and Training

Fire Safety Training is designed to teach faculty, staff, students, and when appropriate, visitors, the preventive measures that will eliminate or minimize causes of fire or fire hazards, fire extinguisher use, and the proper emergency and evacuation procedures in the event of a fire.

### 6.1 Fire Safety Training Goals

The goal of fire safety training is to educate the community on key components of fire prevention, including but not limited to:

- What is fire?
- What are the possible causes of fire?
- What needs to be done to prevent the possible causes of fire?
- Actions to take to mitigate fires
- How to identify fire hazards
- Reporting fire hazards

- How to prepare for a fire emergency
- Participation in fire drills
- Evacuation procedures
- Fire protections systems
- Proper fire extinguisher selection and use

## 6.2 Types of Fire Safety Training

Fire safety training consists of both classroom and hands-on training and is organized in such a way as to meet the needs of specific community member groups based on the kind of fire hazards to which they are exposed. The training groups include:

- Faculty, staff, and students
- Housing facility staff and Resident Advisors
- Students living in residence halls
- Floor Marshals
- Facility Coordinators
- Laboratory workers

## 6.3 Fire Extinguisher Training

Fire extinguisher training is designed to familiarize the university community with information on the classification of fires, portable fire extinguisher classification, the general principles of fire extinguisher use, and the procedures for fighting small fires. This hand-on classroom training provides attendees with the opportunity to use a fire extinguisher to put out a simulated fire.

Fire extinguisher training is available to all CMU community members, however, there are community members who are required to be trained on fire extinguisher use. They include users of the following equipment/areas:

- Laser Cutters
- Maker Spaces
- Laboratories
  - Chemistry



- NanoFab
- Material Science
- Drama Shop
- Student groups involved in Booth and Buggy for Spring Carnival

## 7 Fire Safety Guidelines and Procedures

The Fire Safety Team is responsible for maintaining and publishing university guidelines and procedures addressing campus fire safety. Implemented guidelines and procedures meet legal requirements and environmental, health and safety policies adopted by the university and include, but are not limited to:

- Building Fire/Emergency Evacuation and Drill Guideline
- Fire Alarm System Impairment Guideline
- Floor Marshal Procedures
- Laser Cutter Safety Guideline

## 8 Fire Protection and Life Safety Systems

Fire Protection and Life Safety Systems are building elements designed to protect and evacuate a building in the event of a fire emergency. The university adheres to NFPA standards, which provide the requirements for the inspection, testing, and maintenance of life safety systems. The fire protection and life safety systems found on campus include, but are not limited to:

- Portable fire extinguishers
- Fire hoses
- Fire pumps
- Fire alarm systems
- Emergency lighting systems
- Generator systems (engine driven and battery driven)
- Emergency Power Supply Systems (EPSS)

- Automatic sprinkler systems
- Wet standpipe systems
- Dry standpipe systems
- Fire pumps (diesel driven pumps and electrically driven pumps)
- Private fire service mains
- Fire doors
- Dampers
- Commercial kitchen hood systems
- Type “K” extinguishing systems
- Fixed extinguishing systems (dry chemical and wet chemical)

#### 8.1 Servicing, Testing, and Maintenance

Fire protection and life-safety systems shall be inspected, tested, and maintained as set forth in NFPA, federal, state, and local standards and as may be required by the City Fire Marshal.

Qualified, certified, and/or licensed personnel shall conduct all servicing, testing, repair, maintenance, and tagging of fire protection and life-safety equipment. Personnel not licensed, certified or approved by the City Fire Department or State may be required to provide documentation of licensing or certification by similar approved agencies or authorities or identification as manufacturer’s representative or authorized service personnel.

After installation, service or maintenance a tag shall be completed by a qualified, certified and/or licensed individual. The tag shall indicate the type of work performed and shall be attached to the equipment or system in such a way as to permit convenient inspection and not hamper its activation or operation. A new service tag must be attached each time service is performed.

#### 8.2 Inspection and Maintenance Records

All logs or records of inspection, testing, maintenance, and major repairs of fire protection and life-safety equipment and systems shall be maintained on file for no less than 3 years and made available to the City Fire Marshal or Fire Inspector upon request.

### 8.3 Notification of Systems Out of Service

Insurance Services, EHS, and the City Fire Department should be notified immediately when a required fire protection or life safety system is placed out of service for emergency repairs, replacement or service. All parties shall again be notified when the system is restored to normal operational status.

No fire protection or life-safety system shall be placed permanently out of service unless prior written approval is obtained from the City Fire Marshal.

### 8.4 Tampering

Tampering with or damaging fire safety equipment including automatic door closures, smoke detectors, pull stations, fire extinguishers or sprinkler heads is punishable by law.

Initiating false alarms, stopping existing fire alarms or failing to immediately evacuate during a fire alarm are violations of state fire codes and will be reported to campus police.

## 9 Emergency Evacuations and Fire Drills

CMU is committed to providing equal access to safe egress for any faculty, staff, student or visitor, including those requiring additional assistance. To be successful in providing this assistance, the emergency evacuations and fire drills require the cooperation of every community member.

The purpose of emergency evacuation procedures is to document how to notify occupants of a building emergency, establish evacuation procedures and routes, provide support for persons with disabilities, and account for occupants.

### 9.1 Emergency Evacuations

The procedures that focus on evacuation of occupants as a result of a fire are detailed in the Building Fire/Emergency Evacuation and Drill Guideline. Emergency Action Plans are developed in accordance with Section 404.3.2 of the 2009 International Fire Code.

### 9.2 Community Members Requiring Assistance

Community members with a disability, or anyone not capable of complying with the Building Fire/Emergency Evacuation and Drill Guideline, should contact the Fire Safety Team to develop an individual emergency evacuation plan.

### 9.3 Fire Drills

The Fire Safety Team conducts fire drills for all university buildings as required by law.

The purpose of a fire drill is to enable building occupants to familiarize themselves with emergency procedures, location of emergency exits, and the sound of the fire alarm. The goal is to have the proper actions be an automatic response whenever fire alarms sound so that everyone safely evacuates the area in an orderly manner. Additionally, periodic fire drills will enable the Fire Safety Team to:

- Monitor the timeliness and effectiveness of evacuations.
- Detect technical problems with the fire alarm equipment.
- Check if fire protection equipment, such as fire doors are being used properly.

Fire drills are arranged and supervised by the Fire Safety Team with the cooperation of Floor Marshals, FMCS Life Safety, and University Police. The date and time should be scheduled when most occupants are in the building and in coordination with University Police, specifically once per semester in residential buildings, within the first 10 days of start of school year, and annually in academic and administrative buildings.

The University Fire Safety Manager, or designee, will activate the fire alarm. When the evacuation alarm sounds, occupants must leave the building. After evacuation, occupants shall proceed to the designated outdoor assembly area and wait to receive the all clear from EHS personnel to re-enter. Fire drills will be monitored for effectiveness and shall be documented and retained per the Clery Act by the Fire Safety Manager or designee.

## 10 Permits

Permits are issued by the Fire Safety Team prior to the start of any work that may create a fire hazard. Permits must be obtained in person at the EHS office by all contractors and university maintenance personnel before beginning any work. If emergency work or work is required on a weekend, the application for permit shall be filed at the beginning of the next business day. The work that requires a permit includes:

- Hot Work

- Roof Torching
- Fire Alarm/Protection Impairment

The goal of the permit system is to minimize the risk of fire and protect the university community and property from hazards associated the work.

## 11 Fire Watch

A fire watch is defined as an individual who has the sole responsibility to patrol a designated area, look for signs of fire or other emergencies, and notify the building occupants and/or residents if there is a need to evacuate.

The Fire Safety team collaborates with University Police and Insurance Services to determine the building(s) and event(s) that require a fire watch.

### 11.1 Requirements

A fire watch is required when Hot Work is being performed. Fire Watches are posted during hot work, and for at least 1 hour after completion of hot work to detect and extinguish possible smoldering fires. Details are specified in the EHS Hot Work Program.

A fire watch is also required in the event of temporary failure of the alarm system or where activities require the interruption of any fire detection, suppression or alarm system component.

## 12 Subject Matter Expertise and Oversight in the Design Phase of Construction and Renovation Projects

The Fire Safety Team provides support to Campus Design and Facility Development (CDFD) and FMCS for construction and renovation plan review for structures owned and operated by the University. Projects and facilities are designed, constructed and renovated in accordance with the International Fire Code (IFC), NFPA standards, and other applicable standards.

## 13 Fire Safety Inspections of Campus Buildings

Execution of fire and life safety building inspections is a commitment to the mission and values of the university, its strategic objectives, and promotes a culture of

safety at CMU. The building inspections serve to establish and maintain an inventory of data that identifies risk, prioritizes opportunities for mitigation, and enables risk informed decision-making and prioritization toward future capital renewal projects.

Inspections are performed by the EHS Fire Safety Team.

FMCS is responsible for effective and timely collaboration, partnership, and support.

Campus buildings shall be inspected at least once every 24 months, or as needed, based on the discretion of the Fire Safety Manager. During the spring semester of each academic year, the Fire Safety Team shall collaborate with FMCS leadership to establish and prioritize a schedule for performing inspections of campus buildings for the upcoming Fiscal Year (FY). The time allotted for inspections may vary due to differences in the size and complexity of certain facilities. Prior inspection reports should be available as a comparison reference while conducting the inspection.

If the Fire Safety Team receives a request via ServiceNow to address a potential fire and life safety concern from the CMU community, the Fire Safety Team shall notify FMCS. The Fire Safety Team should work with FMCS to investigate the concern and address any potential issues in a timely manner.

### 13.1 Inspection Scope

The scope of the inspection shall include the building exterior, interior accessible concealed spaces, storage areas, common areas, machine rooms, garage areas, and electrical closets.

During inspections, the Fire Safety team shall take notes of any deficiencies found, taking photographs as needed. At the conclusion of the inspection, the Fire Safety Team should discuss initial findings with FMCS. All deficiencies found during the inspection process shall be documented in a report outlining the deficiency found, location, and the applicable code section. Recurring deficiencies shall be documented on the new inspection report. In the event of an imminent fire or life safety hazard, a corrective action plan should be provided to FMCS to mitigate the hazard. If such hazard cannot be mitigated, the Fire Safety Team shall notify Operations Leadership and submit a safety related work order for remediation. If a finding is challenged, the Fire Safety Team shall research the applicable codes to validate, amend or remove the finding.

The completed inspection report shall be routed through the EHS team for quality assurance and comment. Once quality assured, the final inspection report shall be provided to FMCS, EHS, Operations Leadership, and Insurance Services.

The period between the date of inspection and date of the final report should not exceed ten (10) business days.

Notification of remediated findings by FMCS shall be confirmed by the completed work order via Maximo and submitted to the Fire Safety Team. Notification should include the corrected deficiencies as well as notification of any new work orders. A Fire Safety Team member shall review and validate the remediation provided no further action is warranted.

If further review is needed after a final report has been provided, the Fire Safety Team should conduct an additional review with FMCS and/or additional stakeholders within a two-week period.

#### 14 Program Enhancement and Review

This Program serves as a living document and a work in progress, subject to change under evolving circumstances, such as expanding organizational missions, increasing legal and regulatory requirements, and/or increasing coordination and reporting requirements. As the Fire Safety Program continues to expand, the Program shall be reviewed annually, or as needed, to identify improvements that are necessary to further promote a culture of safety by increasing awareness and educating the community on various aspects of fire safety.