C-13. FIRE SAFETY

I. PURPOSE

This Fire Safety Program establishes procedures and responsibilities for fire prevention and protection at the NCI-Frederick in accordance with OSHA regulations, National Fire Protection Association standards, and NIH policies.

II. DEFINITIONS

Combustible liquid - Any liquid having a flashpoint at or above 100ºF; also known as a Class II or III liquid;

Class II - Flashpoint at or above 100ºF and below 140ºF.
Class IIIA - Flashpoint at or above 140ºF and below 200ºF.
Class IIIB - Flashpoint at or above 200ºF.

Flammable Liquid - Any liquid having a flashpoint below 100ºF; also known as Class I liquids:

Class IA - Flashpoint below 73ºF and a boiling point below 100ºF.
Class IB - Flashpoint below 73º F and a boiling point at or above 100ºF.
Class IC - Flashpoint at or above 73ºF and below 100ºF

Flashpoint - The temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture near the surface of the liquid. NOTE: Burning would not continue at flashpoint temperature.

Hot Work Permit - A document issued by Fort Detrick Fire and Emergency Services prior to the initiation of any work by employees or contractors involving outside fires, use of large open flame equipment (such as tar kettles), torches, open-flame soldering, brazing, welding and burning operations. See Chapter C-18 for detailed Hot Work Permit Procedures.

III. RESPONSIBILITIES

A. Fort Detrick Fire and Emergency Services

1. Respond to and direct all fire and rescue responses to NCI-Frederick facilities within the confines of Fort Detrick.

2. Provide the services of the Permit Authorizing Individual (PAI) in the issuance of hot work permits.

B. Environment, Health and Safety Program

1. Establish and implement a fire prevention and protection program for all NCI-Frederick facilities.

2. Report to the Incident Command Post during fire emergencies and take appropriate action.

3. Under the guidance and direction of the Fort Detrick Fire Department, determine whether the area is safe prior to re-entry by building occupants.

4. Report all fire incidents to NCI Contracting Officer.

C. Supervisor

1. Thoroughly understand emergency response procedures applicable to their area of supervision.

2. Possess knowledge of all potential hazards within their area of supervision.

3. Ensure that emergency response procedures are posted in the area identifying appropriate evacuation procedures. Ensure that employees have reviewed and understand the emergency response procedures. (Reference Safetygram 189 and the Fire Emergency Action Plan, Section IV(C) in this chapter).

4. Assures that all employees have completed emergency training and drills that pertain to the area in which the employee will be working.

5. Ensure that notification has taken place and take reasonable action to evacuate personnel during a fire emergency. Account for all employees and report any missing persons to the Incident Command Post (i.e., Fire Department, Protective Services/EHS, OHS).

D. Employee responsibilities:

1. Attend appropriate training sessions as required by the area and job tasks performed.

2. Report fires to the Fire Department and all emergencies immediately to the area supervisor.

3. Remain within the boundaries of the safe assembly area during an evacuation until you are told it is safe to re-enter the work area.

4. Review the Emergency Response Procedures [Safetygram 189] and the Fire Emergency Action Plan [Section IV(C) in this chapter] and know what to do in the event of an emergency.

5. Maintain fire-safe conditions in their respective areas.

6. Report unsafe fire conditions to EHS or their supervisor.

7. Comply with the requirements of this chapter.

IV. POLICIES & PROCEDURES

A. Administration

1. The Director, EHS, implements fire prevention and the fire emergency programs.

2. Fire and emergency response services are provided to the NCI-Frederick through an interagency agreement between the U.S. Army Garrison and the National Cancer Institute. The Fort Detrick Fire Chief and his staff are responsible for extinguishing fires and for subsequent determination of safe reentry into those areas. Upon arrival at the scene, the Fort Detrick Fire Chief will assume incident command, and all employees will follow his directions.

3. EHS staff will evaluate all areas at least annually to ensure compliance with the Fire Safety Program.

B. Fire Prevention Plan

This ***Fire Prevention Plan*** is intended to provide employees with basic information on the major fire hazards and control methods at the NCI-Frederick in accordance with 29 CFR 1910.39. For more information, contact the Environment, Health & Safety Program in Building 426 at 301-846-1451.

1. Major fire fuel sources hazards, their proper storage and handling, and available fire control equipment:

Fuel Source Hazard	Proper Storage & Handling	Fire Control Equipment
Accumulation of ordinary combustibles, such as paper, cardboard, office trash, other combustible wastes.	Daily housekeeping activities to remove these items from the workplace; Periodic inspections to ensure adequate housekeeping.	Multipurpose dry chemical fire extinguisher; Automatic sprinkler systems in many buildings.
Flammable and combustible liquids – reagents in laboratory areas, gasoline and diesel fuel in maintenance areas.	Store in approved containers in flammable storage cabinets or flammable storage rooms.	Multipurpose dry chemical fire extinguisher; Installed dry chemical or inert gas extinguishing systems in flammable storage rooms.
Flammable solvent waste.	Store in approved waste containers; Periodic satellite accumulation area inspections and weekly removal by Waste Management staff.	Multipurpose dry chemical fire extinguisher.

2. Major potential fire ignition sources and their control procedures:

Ignition Source	Control Procedure
Energized electrical equipment.	Do not store flammable and combustible materials in close proximity to energized electrical equipment.
Hot Work, such as welding, grinding, soldering, similar operations producing heat, spark, or flame.	Follow the NCI-Frederick Hot Work Permit Procedure, Chapter C-18 in the Safety Operations Manual.
Laboratory operations involving heat or flame producing equipment.	Follow the manufacturer's recommendations for equipment use and maintenance. Keep flammable and combustible materials away from heat or flame producing equipment.

Cooking and food warming equipment.	Potential fires in the food preparation area of the Building 549 are controlled by installed wet chemical suppression systems. Building 549 is also protected by an automatic sprinkler system.
Portable space heaters	Space heaters must meet certain design requirements to be used at the NCI-Frederick. An inspection and tagging program ensures that heaters are approved and used safely.
Coffee makers and hot plates.	These items must be placed on surfaces that are not easily combustible. Additionally, these items must be turned off or disconnected at the end of the day.
Smoking	No smoking is allowed on the NCI-Frederick campus or in vehicles. Dispose of smoking trash (e.g., matches, cigarette butts) in designated receptacles before entering NCI-F property.

3. Personnel responsible for maintenance of fire suppression systems:

   Testing and maintenance of portable fire extinguishers, fire detection and alarm systems, and fire suppression systems is performed through a sub-contract with a vendor specializing in these activities. The Environment, Health & Safety Program, conducts fire extinguisher inspections and periodic fire prevention inspections.

4. Personnel responsible for controlling fire fuel source hazards:

   Supervisors at all levels are responsible for the control of fuel source hazards in their area of responsibility. Employees are also responsible for maintaining a fire-safe work environment and reporting any unsafe conditions to their supervisor. In addition, periodic fire prevention inspections are performed by EHS to assist supervisors and employees in identification of potential fuel source hazards.

C. Fire Emergency Action Plan

1. Evacuation Policy

In the event of a fire, all employees shall evacuate the workplace immediately by means of the nearest available marked exit. Proceed as quickly as possible in an orderly manner. Accompany and assist handicapped personnel, visitors, and any co-workers who appear to need direction or assistance. Do not push or shove. Hold handrails when you are walking on stairs.

2. Emergency Escape Notification Procedure

Employees are alerted for emergency evacuation by the activation of the building fire alarm system. The emergency evacuation signal consists of mechanical bells, electronic horns, and flashing strobe lights.

3. Reporting a Fire Emergency

To report a fire emergency, activate the building fire alarm system on your way out of the building by following the instructions on the nearest pull station. Once outside, call 911 from a cellular phone or an NCI-Frederick phone in a nearby building.

4. Use of Portable Fire Extinguishers

Portable fire extinguishers are provided in the workplace. In the event of a fire, an employee may attempt to extinguish an early stage fire before evacuating. Do not attempt to control a fire with a portable fire extinguisher without appropriate training. Contact EHS for training information.

5. Critical Operations Shut Down

No employees are authorized to delay evacuation for perceived critical operations. Immediately cease all operations that may become hazardous. Shut all doors behind you as you exit the building. Closed doors can slow the spread of fire, smoke, and water.

6. Accounting for Employees After Evacuation

The Supervisor in each area is responsible for ensuring that all occupants evacuate the area. In addition, every employee should check that all others in the area are leaving as instructed. The

Assembly Areas for the 100+ buildings at the NCI-Frederick are available from your Supervisor or the Environment, Health & Safety Program. Supervisors at all levels are responsible for accounting for their employees at the assembly area after an evacuation. Do not re-enter the building to look for missing personnel. Report the last known location of any missing employees to the Fort Detrick Fire & Emergency Services on-scene Incident Commander.

7. Medical and Rescue Operations

Medical and rescue services during emergency evacuation situations are provided by the Fort Detrick Fire & Emergency Services or any other emergency response group under their command.

D. Reporting of Fires

1. The Fort Detrick Fire Chief, in cooperation with the Area Supervisor and EHS, will investigate all fires and submit a copy of the final report to the NCI Contracting Officer.

2. The report will contain a narrative of the incident, including time, place, equipment, personnel, circumstances causing the fire damage, and proposed corrective actions to prevent a recurrence.

3. The report will be processed as follows:

a. Reviewed and forwarded by EHS to the Prime Contract Administrator, Contracts and Administration, OTS, NCI-Frederick.

b. Reviewed and forwarded by the Prime Contract Administrator, Contracts and Administration, NCI-Frederick, to the NCI Contracting Officer.

V. REQUIREMENTS

A. **Exits**

Nationally recognized building and fire codes require free and unobstructed egress from all occupied areas of a building. The parts of a building that are particularly important in an emergency exit situation are corridors, fire doors, stairways, and exits. Obstructions to any of these components in the egress system will compromise the evacuation of

occupants in an emergency. Keeping all of these egress components unobstructed and operational at all times is critical to the safety of yourself and co-workers.

1. Corridors provide the main access path to exits in emergencies. They must remain clear and unobstructed at all times. Corridors must not be used for hazardous material storage or work processes.

2. Fire Doors are provided in corridors to segregate a building into sections and contain the spread of fire and smoke. This compartmentalization provides critical protection in the event of a fire, allowing occupants additional time to evacuate a building. Fire doors must be kept closed at all times. If these doors are propped open, fire and smoke will spread freely from one section of a building to another, particularly in buildings that are not equipped with automatic fire suppression systems.

3. Stairways provide a continuous, unobstructed safe path of travel between the floors of a building to an exit. Space within a stairwell (stairs, landings, and space beneath stairs) may not be used for storage of anything.

4. Exits and exit doors must allow free and unobstructed egress from the building. All exits must be clearly recognizable, or exit routes must be conspicuously marked so that occupants can quickly escape in an emergency.

B. Corridor Clearance and Use

Building occupants must have clear and unobstructed access to all the components of an exit, including exit doors, passageways, stairs, and ramps. These guidelines address some clearance situations encountered at the NCI-Frederick. Further guidance is available from the Environment, Health and Safety Program in Building 426 at X1451.

1. Fire alarm pull stations, fire extinguishers, sprinkler heads, and emergency shower / eye wash stations shall remain clear and unobstructed at all times.

2. Corridors in laboratory facilities must provide 44 inches of clear and unobstructed egress under normal operating conditions. Office occupancies may allow a corridor clearance less than 44 inches. Temporary exceptions require approval of the local Authority

Having Jurisdiction and EHS.

3. No storage of any type is allowed in stairwells.

4. Storage in corridors is restricted to one side of the corridor. The same side of the corridor should be used throughout a building.

5. No hazardous materials may be stored in corridors, including flammable and combustible liquids, hazardous chemicals, biological materials, radioactive materials, and compressed gas cylinders.

6. Do not store surplus property in corridors. Contact the Property Accountability Office at X1156 for assistance.

7. All storage in corridors shall be contained within suitable cabinets of non-combustible construction – no plastic or wooden cabinets shall be used. Full metal doors are preferred on storage cabinets to eliminate the risk of personal injury should someone fall against a glass door.

8. Placement of cabinets must allow a minimum 30-inch wide access to electrical service panels and emergency alarm panels found on corridor walls.

9. During renovations and new construction, anticipate storage requirements and design accordingly.

C. **Fire Extinguishers**

1. Extinguisher type and location is in accordance with NFPA 10 standards. Extinguishers are not to be relocated except by EHS.

2. As part of the monthly fire extinguisher inspection, EHS ensures that all extinguishers are:
   i. Accessible.
   ii. Properly installed and securely supported.
   iii. Properly sealed (seal intact).
   iv. Free from mechanical damage or corrosion.
   v. Pressurized (dry chemical type), with proper pressure indicated on gauge.
   vi. Free from obstructions in horn or nozzle.

D. Electrical Safety

Hundreds of people die and thousands more are injured each year in accidents involving electrical fires or shocks. Following some simple electrical safety rules can prevent most of these incidents.

1. GFCI

GFCI stands for ground fault circuit interrupter, an electronic device that constantly monitors the amount of current flowing through a circuit and cuts off the electricity at the first sign of an imbalance. Because GFCI's respond to excessive amperage demands faster than fuses or circuit breakers, they protect you from prolonged electrical shocks by interrupting the current flow. GFCI's can be hard-wired into a building's electrical distribution system or installed at the outlets. They are generally installed outdoors, in damp areas such as basements, and near water-hazard locations such as within five feet of sinks. Contact the Electric Shop (X5409) if there are any questions about the presence or need for GFCI-protected circuits in your work area.

2. Fuses and Circuit Breakers

- If a fuse blows or a circuit breaker is tripped, don't just replace or reset it. Find out what caused the circuit to overload and correct the problem.

- Avoid using several high-amperage pieces of equipment, such as heat-producing appliances, on the same circuit.

3. Electrical Outlets & Plugs

- Plugs must match the outlets. Three-pronged plugs require three-wire receptacles.

- Polarized plugs with one prong wider than the other are standard and require polarized receptacles. Never alter the wide prong of a polarized plug to make it fit into an outdated outlet.

- Never cut off or bend the ground pin of a three-pronged plug. Proper grounding is essential to minimize fire and shock hazards.

- Have a professional electrician replace old or damaged outlets with three-wired, polarized receptacles. Contact the Trouble Desk at X1068 for assistance.

4. Equipment & Appliances

- All equipment and appliances should be labeled by an independent testing laboratory, such as Underwriters Laboratory (UL) or Factory Mutual (FM) indicating that they meet basic safety standards.

- Keep heat-producing appliances, such as electric space heaters, at least three feet from furniture, curtains, paper and other combustible materials.

- Allow plenty of air space around equipment to prevent overheating.

5. Electrical Cords

- Keep electrical cords away from the hot areas of heat-producing appliances.

- Keep electrical cords out of travel paths. Do not run cords under carpets or across doorways.

- Replace any cord that is cracked, frayed, or otherwise damaged.

- Never pinch an electrical cord against walls, furniture, or in a doorway.

- Extension cords are used for temporary service only and are not a substitute for fixed wiring. New receptacles may need to be installed for permanent equipment.

6. Outdoor Power

- Use only weatherproof fixtures and GFCI outlets for outdoor installations and appliance use.

- Never run outdoor extension cords across driveways or traffic areas.

- Never use electrical appliances outdoors in wet weather or when the ground or grass is wet, unless the appliance is specifically designed and labeled by an independent testing laboratory for such use.

7. Lighting

- Place lamps on level, uncluttered surfaces and be sure that lampshades are secure to protect the bulb from breaking if the lamp is knocked over.

- Light bulbs should not exceed the wattage recommended for a lamp or fixture.

8. Power Lines

- Report downed power lines and warn others in the area.

- Never go near or touch a downed power line. Doing so can result in a fatal shock or severe injury.

- Keep ladders, especially metal ones, away from power lines. This includes overhead electrical services to buildings.

9. Warning Signs

You can spot many electrical problems before they cause a fire or shock. Be alert to the following danger signs;

- Recurring problems with blowing fuses or tripping circuit breakers.

- Feeling a tingle when you touch an electrical appliance.

- Discoloration of wall outlets or switches.

- Sizzling sound at wall outlets or switches.

- A burning smell or unusual odor coming from equipment or wiring.

- Flickering lights.

When you spot a warning sign, don't wait for an accident or fire - take action immediately. Unplug a malfunctioning appliance if you can do safely and call the Trouble Desk (X1068) to have an electrician investigate the problem.

E. Compressed Gases

Due to the nature of compressed gas cylinders, special storage and handling precautions are necessary. The hazards associated with compressed gases include oxygen displacement, explosion hazards, toxic effect of some gases, and the physical hazards of a ruptured cylinder. There are nearly 200 different types of materials in compressed gas cylinders including atmospheric gases, fuel gases, refrigerant gases, and poisonous gases.

The Occupational Safety and Health Administration (OSHA) has regulations governing the use of compressed gases. These regulations further refer to specific Compressed Gas Association materials. The Compressed Gas Association (CGA) is a leader in promoting safe practices when working with compressed gases. CGA has developed many publications designed to ensure the safe handling of compressed gases during manufacture, storage, transportation, distribution and use. Following are some of their recommendations.

1. Inspection

   Gas cylinders should be visually inspected to ensure that they are in safe condition. Leaking regulators, cylinder valves or other equipment should be taken out of service. A cylinder's contents should be identified at all times. Also, a cylinder’s status should also be identified as to whether the cylinder is full, empty, or in service.

2. Storage

   Gas cylinders should be properly secured at all times to prevent tipping, falling, or rolling. They can be secured with straps or

chains connected to a wall bracket or other fixed surface, or by use of a cylinder stand. Store cylinders in a cool, dry, well-ventilated, fire-resistant area.

Cylinders should be stored where they will not be knocked over or damaged. When a cylinder is not being used, the valve should be closed and the valve protection cap secured in place. The valves of empty cylinders should also be closed.

3. Handling & Use

Transport gas cylinders so that they do not tip, fall, or roll. Cylinders should transported in a cylinder truck or cart. Cylinder valves must be closed, regulators must be removed, and valve protection caps must be in place before moving cylinders. Steel-toed safety shoes must be worn when transporting compressed gas cylinders.

Take precautions so that gas cylinders are not dropped or allowed to strike each other or other objects. Damaging the cylinder valve could turn the cylinder into a dangerous missile with the potential to destroy property and injure personnel.

Select the proper regulator for use with each gas cylinder. Do not use lubricants of any type on a gas cylinder regulator. Do not tamper with or attempt to repair a gas cylinder regulator.

Consult the appropriate Material Safety Data Sheet (MSDS) for detailed information on the contents of the gas cylinder. Specific handling and storage precautions will be outlined in the MSDS. The MSDS will also have specifications for appropriate personal protective equipment for worker protection.

F. **Flammable and Combustible Liquids**

1. Inside Storage

a. Storage rooms: Specially constructed rooms designed to contain the flammables in the event of a spill or fire and equipped with extinguishing systems. Doors of these rooms are to be "labeled in conspicuous lettering" stating "FLAMMABLE - KEEP FIRE AWAY". Quantities of combined flammables and combustibles are not to exceed 5

gallons per square foot of floor space for floor areas up to 150 square feet.

b. Storage cabinets: NFPA 30 approved metal cabinets designed for storage of flammables. Doors are to be "labeled in conspicuous lettering" stating "FLAMMABLE - KEEP FIRE AWAY". Quantities of liquids are not to exceed 60 gallons of Class I and Class II liquids. Vents, if provided, are to be plugged or piped to the building exterior and not open to the room or area.

c. Containers: An approved container is one that is acceptable under the requirements of the Department of Transportation.

d. Quantities in use: Flammables and combustibles in use shall be restricted to the amount necessary to complete the task and shall not include spare quantities readily available except in approved cabinets, approved rooms, or approved containers. Normally, the aggregate capacity outside of storage cabinets or rooms shall not exceed 10 gallons. Bench tops, laboratory cabinets and base cabinets are not proper storage areas for flammable or combustible liquids.

e. Refrigerated storage: Flammable liquids shall not be stored in ordinary refrigerators or freezers. Storage of well-sealed containers is permissible in approved flammable materials storage refrigerator/freezers. The outside doors of the refrigerator/freezer shall be labeled to denote if they are safe for storage of flammable liquids.

2. Outside storage

Outdoor storage of flammable and combustible liquids is subject to OSHA, EPA, and NFPA restrictions. Since circumstances can vary widely, detailing each possible scenario is beyond the scope of this document. Please contact EHS for specific guidance when outdoor storage of flammable or combustible liquids is anticipated.

3. Gasoline and other volatile flammable liquids

a. Use of volatile flammable liquids for cleaning purposes is prohibited.

b. Safety cans will be used for supplying gasoline to portable equipment; no more than one 5 gallon container will be kept inside any building. Equipment will be turned off and smoking prohibited while gasoline is dispensed to gasoline operated equipment.

G. **Paints and Related Products**

1. All paint, varnish, turpentine, thinners and other flammables used in conjunction with painting will be kept in approved containers and stored as specified in the Section F - Flammable and Combustible Liquids.

2. Spray painting will be limited to outdoors or to approved spray booths.

3. When using pressurized paint spray cans, keep away from all sources of ignition (smoking, running motors and other electrical appliances, open flame devices, etc.) Not more than one can will be used at any one time in the same area.

H. **Housekeeping**

All buildings will be kept clean, orderly, and free from accumulation of combustible materials. Means of egress shall remain unobstructed at all times. Particular attention will be given to ensure that:

1. Spaces under stairways are kept free of storage of any kind.

2. Attics, basements, utility rooms, and closets are kept free of materials that have served their reasonable foreseeable usefulness.

3. Attics, basements, and utility rooms are not used for storage except for noncombustible materials that are used in the maintenance of the building equipment.

4. All trash receptacles used within all buildings shall be metal or noncombustible synthetic. All large trash receptacles must be covered with a metal or noncombustible cover.

5. All floor wax must be nonflammable. Petroleum base waxes are prohibited.

6. Nothing shall be hung or laid on steam or sprinkler piping.

7. Only fire retardant or other noncombustible decorations are permitted.

8. All curtains and drapes will be fire retardant or noncombustible.

I. Outside Fires

1. Outside fires are prohibited without prior approval and issuance of a Hot Work Permit. See Chapter C-18.

2. Fireworks and other pyrotechnics are prohibited.

3. Persons having knowledge of any condition that might tend to cause or spread any outside fire are requested to promptly notify the Fort Detrick Fire and Emergency Services and EHS.

J. Work Requiring a Hot Work Permit

With the exception of designated welding areas (Weld, Pipe, Machine Shops), a Hot Work Permit must be obtained from the Fort Detrick Fire and Emergency Services prior to all outside fires, use of large open flame equipment (such as tar kettles), torches, open-flame soldering, brazing, welding and burning operations. Representatives of the Fort Detrick Fire and Emergency Services will conduct an inspection of the immediate area to determine that all flammable and/or combustible material has been removed or protected. Appropriate fire extinguishers must be readily available at all times. See Chapter C-18 for detailed information regarding hot work permits.

K. Smoking

Smoking is prohibited within the NCI-Frederick campus and in any NIH-

owned buildings and vehicles. See NCI-Frederick Policy 605, Eating, Drinking, Storage of Food or Drink, and Smoking in Work Areas, for more information.

VII. REFERENCES

1. 29 CFR 1910 Occupational Safety and Health Administration regulations.
2. National Fire Protection Administration standards.
3. NIH Manual policies.