2. Fire Protection
One of the most fearsome and damaging disasters that can occur in work activities is fire. In the variety of activities performed in campus operations, there are shops and job sites in which potential fire hazards exist. Fires can be prevented by a) orderly planning, b) sensible arrangement of fire-producing activities in relation to combustible materials, and c) good housekeeping.

It is necessary that shops and job-site activities that contain potential fire hazards have a plan to combat fire. The plan must include: 1) adequate warning measures for alerting all persons in the fire area; 2) rapid reporting to the Fire Department; 3) evacuation of affected personnel from the fire area; 4) procedures for containing the fire insofar as it is safe to do so and to the extent that it is possible to maintain safe exit for personnel; 5) instruction on duties to perform in a fire situation; and 6) adequate fire extinguishing equipment that is regularly inspected by a responsible authority.

It is far better, of course, to prevent fire from occurring. When it is necessary to use any potential fuel (material or substance) that is more than ordinarily combustible, suitable precautions must be taken to exclude exposure to heat or flame. Proper storage and disposal of flammable liquids or combustible materials will prevent build-up of internal heat and spontaneous combustion. Separation of highly volatile, hazardous substances, such as gasoline, from areas occupied by people or equipment is highly desirable whenever possible. It is necessary that the introduction of open flames, or the use of electric equipment that may arc, be prohibited in areas where volatile, explosive substances are used or stored.

2.1 Safety Rules for Fire Prevention
SR 2.1.1 Use only approved solvents when cleaning and repairing machinery and equipment. Use of gasoline to clean machinery and equipment is prohibited.

SR 2.1.2 Oily rags and other flammable wastes must be disposed of in approved covered metal containers. Such debris shall be removed from shops and buildings as soon as possible, and in no case shall it be left unattended in a building overnight.

SR 2.1.3 The fueling of any type of motorized equipment while the engine is running is prohibited.

SR 2.1.4 Exits shall not be locked (chained or otherwise) from the inside.

SR 2.1.5 Only intrinsically safe flashlights will be used near flammable liquids or vapors or when entering an enclosure suspected of containing a flammable substance.

SR 2.1.6 Cleaning solvents used in shops shall be kept only in approved containers.

SR 2.1.7 Gasoline utilized in small quantities in shops for fueling engines being repaired, tested, adjusted, etc., shall be handled and dispensed only in UL approved metal safety cans.
2.2 Procedures to Reduce Causes of Fires

2.2.1 When transferring flammable liquids make certain the filler nozzle touches the equipment or can being filled or bond the two containers in order to guard against the build-up of static electrical charges.

2.2.2 Never overfill a tank; rather, under fill it to allow room for expansion of the liquid.

2.2.3 Dark places, basements or cellars must not be entered without proper light. The use of matches is strictly forbidden.

2.2.4 All heavy equipment is to have a "dry chemical" fire extinguisher in the cab.

2.2.5 Stay out of areas suspected of containing a concentration of flammable vapors, and call 4000 - campus emergency phone number.

2.3 The Chemistry of Fire

In order to have a fire, oxygen, fuel and a source of ignition (heat) must be present. These three items are referred to as the "fire triangle." Any two of the above can co-exist without a fire as long as the third is not present. Since the atmosphere in nearly all activities is oxygen bearing, either the fuel source or the heat source must be eliminated. Of these, it is usually the most practical to eliminate the heat source. Examples of this include shutting down of heat-producing sources such as gas-operated appliances, electric heaters, welding, soldering or cutting operations in the immediate area. To avoid a spark from discharge of static electricity during open-system filling operations, a positive ground shall be provided between the storage container and the container being filled.

2.4 Fire Fighting Equipment and Procedures

Automatic fire protection equipment and public fire departments cannot always be depended upon to prevent fire loss. It is very important that each employee understand why, where, and how to use the various types of firefighting equipment: available in the work area.

2.4.1 Fire extinguishing equipment appropriate for the type of potential exposure shall be maintained in all building work areas. Equipment shall be regularly inspected to ensure that it is in working condition.

2.4.2 Fire protection equipment shall be prominently displayed and kept clear for easy access at all times.

2.4.3 Do not use water-type extinguishers on electrical fires because of the danger of electrocution and damage to equipment. They are intended for use on Class "A" fires only (flammables such as wood, paper, rags, etc.).

2.4.4 Fire extinguishers are classified by the type of fire that they will extinguish:
Class A

A Class A fire extinguisher is used for ordinary combustibles, such as wood, paper, some plastics and textiles. This class of fire requires the heat-absorbing effects of water or the coating effects of certain dry chemicals. Extinguishers that are suitable for Class A fires should be identified by a triangle containing the letter "A." If in color, the triangle should be green. Extinguishers rated for Class A hazards are: water, chemical foam and multi-purpose dry chemical types.

Class B

A Class B fire extinguisher is used for flammable liquid and gas fires such as oil, gasoline, etc. These fire extinguishers deprive the fire of oxygen and interrupt the fire chain by inhibiting the release of combustible vapors. Extinguishers that are suitable for Class B fires should be identified by a square containing the letter "B." If in color, the square should be red. Extinguishers rated for Class B hazards are: carbon dioxide, dry chemical, aqueous film forming foam and halon substitute.

Class C

A Class C fire extinguisher is used on fires that involve live electrical equipment which require the use of electrically nonconductive extinguishing agents. (Once the electrical equipment is deenergized, extinguishers for Class A or B fires may be used.) Extinguishers that are suitable for Class C fires should be identified by a circle containing the letter "C." If in color, the circle should be blue. Extinguishers rated for Class C hazards are: carbon dioxide, dry chemical and halon substitute. A halon substitute fire extinguisher shall be accessible in all areas where computers are housed or in use.

Class D

A Class D fire extinguisher is used on combustible metals such as magnesium, titanium, sodium, etc., which require an extinguishing medium that does not react with the burning metal. Extinguishers that are suitable for Class D fires should be identified by a five-point painted star containing the letter "D." If in color, the star should be yellow. Extinguisher type is a dry powder (suitable for the specific combustible metal involved).
Class K

K

A Class K fire extinguisher is used on fires involving cooking media (fats, grease, and oils) in commercial cooking such as restaurants. These fire extinguishers work on the principal of saponification. Saponification takes place when alkaline mixtures such as potassium acetate, potassium citrate or potassium carbonate are applied to burning cooking oil or fat. The alkaline mixture combined with the fatty acid create a soapy foam on the surface which holds in the vapors and steam and extinguishes the fire. These extinguishers are identified by the letter K.

Other References

- See UM Campus Safety Manual, Chapter 14 – Hot Work Program for specific rules regarding any ‘hot work’ on campus.