Fire Prevention Program
INSTRUCTOR'S TRAINING MANUAL

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TRAINING REQUIREMENTS

Below is a list of the Emergency Action Plan and Fire Prevention Plan Requirements. OSHA requires that these plans be implemented in writing if your company has more than 10 employees. The rules for these plans are found in CFR 1910. 38 parts (a) Emergency action plan and (b) Fire prevention plan. Our Fire Prevention plan contains all the necessary elements of the Emergency Action Plan. Therefore, if you have our Fire Prevention Program, you also have your Emergency Action Plan. The following list contains the main requirements of each plan. Theses requirements are covered in detail in this training guide (as well as the Student's Guide) Keep in mind that your facility may have unique requirements based on its layout etc.

EMERGENCY ACTION PLAN

1. Emergency escape procedures i.e. when, where, how, etc.
2. Procedures for employees who remain to run critical plant operations (if any).
3. Procedures to account for all employees. (i.e. roll call, name rosters etc.)
4. Rescue and medical duties (if any) for those who are to perform them.
5. Fire reporting procedures (as well as any other emergency i.e. earthquake).
6. Names of responsible employees (management)
7. Establish warning/alarm system. Insure employees know the warning signal!
8. Employees trained in "the safe and orderly emergency evacuation of employees". (Fire Drill would cover this!)
9. Employers are required to train all employees on the Emergency Action Plan.
10. Written plan kept at workplace and available for review.
11. Site plan showing fire equipment, exits, assembly areas, evacuation routes etc. Note: this is not a requirement however it is mentioned in the non-mandatory guidelines as a means to insure employee awareness of evacuation procedures.

FIRE PREVENTION PLAN

1. List of major workplace hazards and their proper handling and storage procedures, potential ignition sources i.e. smoking, flammables, extension cords, etc.
2. Available fire fighting equipment, i.e. extinguishers (extinguishers require annual training), hose, sprinklers etc.
3. Names/Titles of employees responsible for maintaining equipment.
4. Housekeeping procedures (i.e. keeping paper away from ignition sources, close rag containers, no smoking indoors, disposal of cigarette butts.
5. Training. Employees shall be trained on all relevant hazards.
6. Employer shall train/review with each employee all parts of the plan.
7. Plan shall be kept in workplace and available for review.
8. Maintenance procedures for equipment. These procedures are intended to prevent fires from improperly maintained equipment.
9. Post "you are here" signs, especially in areas where the outside exit cannot be seen.

If your company has less than 10 employees these plans can be communicated orally. Be sure however, to have a sign in sheet or some documentation that indicates that employees were briefed.

The regulations only require a one-time training. However, if through your annual review/audit you find employees demonstrate a lack of knowledge or failure to follow procedures, then you might want to consider annual training as a means of performing "good faith" efforts at compliance.

RETRAINING...will occur if....

*** If through inspection management feels that it is necessary.**

*** If a lack of knowledge is demonstrated by failing to follow procedures.**

TRAINING CHECKLIST

1. Ensure all appropriate employees are identified for training.

2. Identify anyone of the above employees who may have learning disabilities or may have difficulty with English, and make arrangements for their training.

3. Designate where training will take place and make sure everyone knows time/place.

4. Ensure you have enough training materials for all participants. You will need the following training materials:
   a. **Student Guides.** One per each employee attending.
   b. **Tests/Answer Sheets.** One per each employee attending.
   c. **Training Certificates.** One per each employee attending. (You might want to sign one master copy and then reproduce, to save having to sign each individual certificate following training.)
   d. **Copies of Evacuation Plan Site Diagram.** To show employees so they will know where to go in an evacuation.
   e. **Ink pens.** For taking test and signing certificates (not pencils).
   f. **Class sign-in sheet.** Be sure each attendee signs!
   g. **Fire Extinguisher.** Demonstrate and discuss the different types of extinguishers i.e. ABC etc.

5. Be sure you know the following information prior to class.
   a. **Smoking policy.** What is your company's smoking policy? I.e. where allowed, when allowed etc.?
   b. **Evacuation Assembly Area.** Where exactly outside of the building are employees going to go for head count in the event of an evacuation.
   c. **Evacuation** (You are Here Signs!) **Plan Site Diagrams/Maps.** Are these maps completed and posted throughout your facility?
   d. **Fire Extinguisher Training.** Has the training been conducted? If not, you may be able to coordinate it with the Fire Marshall to immediately follow your Fire Prevention Class.
   e. **Rag Containers.** Does your facility have metal rag receptacles with lids? If not when?
   f. **Fire Drills.** Does your facility intend on conducting fire drills? If so, how is this going to be coordinated?
   g. **Alarm/Intercom System.** What is the primary means of emergency/evacuation notification of employees? Is it Alarm, Intercom or Voice or combination of these three?
   h. **Fire Prevention Supervisor.** Be sure you know who your company's fire prevention supervisor is and whether he or she can participate in the training.
   i. **Grounding/Bonding.** Be sure you company is currently grounding and bonding your flammable/combustible liquids.
   j. **Spill Containment**. Is your company currently spill containing your flammable liquids?
   k. **Spill Kit.** Does your company have on hand spill kits and absorbents to clean up potential spills?
   l. **Extension Cords.** Does your company allow the use of extension cords? Power Strips?
   m. **Exits.** Does your company have sufficient exits? Unlocked during business hours? (From inside)
   n. **Emergency lights.** Does your company have sufficient illumination to allow employees to safely exit the building, especially in situations such as power outages? If not, when are they going to be installed?
   o. **Electrical Panels.** Have you checked to ensure that the electrical panels in your facility are not routinely blocked? (Must have 36" access at all times.)
   p. **First Aid Kits.** Available and well stocked?

Training Sequence

1. **Review checklist to make sure everything is ready.**
2. **Have employees sign the Class Sign-In sheet.**
3. **Pass out training guides to employees.**
4. **Give them a brief introduction and cover section I.**
5. **Review the remainder of the training guides with them. Encourage discussion or questions.**
6. **Following student guide instruction, ask for any remaining questions.**
7. **Give out test and instructions.**
8. **Following the test, have employees trade tests and grade. Answer any questions.**
9. **Pass out Training Certificates to be filled out and signed.**
10. **Collect tests and certificates.**
11. **If time allows, take employees through the actual evacuation procedure doing a slow "walk through" to ensure everyone is clear as to what to do in the event of an evacuation.**
12. **If prearranged, conduct fire extinguisher training.**

Class Introduction to Fire Prevention

'Fire Prevention and Emergency Evacuation Training'

Introduction

My name is.....

Today we are going to talk about one of the most important safety programs as it relates to preventing serious accidents. And that is Fire Prevention.

Every year hundreds of industrial fires occur in the United States. Most of these fires are completely preventable. Studies show that many causes of these fires are a result of employees not following good fire prevention procedures. Unfortunately many of these fires result in the deaths of employees and firefighters. This class will give you good specific information you need to prevent the most common type of fires you may be faced with. As an employee you should take responsibility for your safety as well as doing what you can to help your fellow employees. Also, keep in mind that a lot of the information that you will hear today, you can also use in your own home to protect your family!

Fire Prevention Class Instruction Sequence

We will first review the Student Guide that you have before you. If at any time you have any questions please ask them! If we begin to run out of time, write your questions and comments down and ask me after the class or ask your supervisor. In this class you will be instructed on the key aspects of Fire Prevention and Emergency Evacuation. If there is something you think we should add to this program, please let us know!

Test

Following the review of the Student Guides, you will be taking a 20-question test. You may use your notes and Student Guides to take the test, as most of the answers come from the guide. Following the test, you will trade papers and I will review the answers. Also, this is your last opportunity in class for you to ask questions, especially for those questions on the test you may have answered incorrectly. You can, of course, ask questions later outside of class!

Certification

Following the test, you will fill out certifications and return along with the signed and dated test.

BE SURE EVERYONE SIGNED THE "SIGN IN" SHEET!

Outside class exercise

Following the class instruction, if time allows, we will walk through our evacuation procedures.
(OR)
We will conduct fire extinguisher training for a designated group of employees (may be conducted by the Fire Marshall or by our fire extinguisher service company).

Student Guide
Section I Introduction

A. Introduction

1. **Importance of Fire Prevention Training.** Fire prevention training is obviously important because it will save lives. Each year hundreds of people die in fires. Many of these fatal fires take place in the workplace. This training is designed with the purpose of first and foremost to prevent fires. And secondly, should a fire break out, you, as an employee will be trained to know exactly what to do! One of the first things you need to be aware of is some of the most common type of fires and their relative frequency. They are as follows:

(Q # 1)

   a. **Electrical Causes (30 percent).** These would include faulty wiring, motors, switches, lamps, and heating elements.

   b. **Smoking and Matches (21 percent).** This includes situations where people smoking are doing so too close to flammable or combustible liquids and perhaps falling asleep while smoking. Also, children often play with matches and fires often result.

   c. **Friction (15 percent).** This can be caused by hot bearings, misaligned or broken machine parts, choking or jamming materials, and poor adjustment of moving parts.

   d. **Hot surfaces (10 percent).** This includes exposure of combustibles to furnaces, hot ducts, or flues, electric lamps or heating elements, and hot metal.

   e. **Overheated Materials (8 percent).** Includes abnormal process temperatures, materials in dryers and overheating of flammable liquids.

   f. **Open Flames (7 percent).** Especially around gasoline or other types of torches and/or gas/oil burners.

   g. **Combustible Metals (5 percent).** For example, magnesium dust can ignite then ignite other materials. Magnesium once ignited is extremely difficult to extinguish.

   h. **Spontaneous Combustion (4 percent). D**eposits in ducts and flues, low-grade storage, scrap waste, oily waste, rags and rubbish can spontaneously combust.

2. **Company Fire Safety Policy.**

STATEMENT OF COMPANY FIRE SAFETY POLICY

Fire and Health Safety in our business must be a part of every operation. Without question it is everyone's responsibility at all levels.

Our Fire and Safety program will include all necessary mechanical and physical safeguards as well as inspections to find and eliminate unsafe fire conditions or practices. Our program will emphasize training for all employees in good fire safety practices, use of personal protective equipment and use of fire extinguishers. **However, it will be the policy to evacuate the building in the case of a fire.**

To be successful, our fire and safety program needs the cooperation and involvement of every one. **Fire Safety is your responsibility**.

3. **Program Summary.**

   a. **Section I Program introduction.** The importance of Fire Prevention Awareness and Training.

   b. **Section II Fire Prevention.** Discusses the best way of avoiding fire injury and that is to prevent them to begin with. These are some practical steps you can use to help prevent fires. However, these steps are not all inclusive. Both Supervisor and Employee must review all steps and add or subtract as necessary. Your facility may have unique requirements or hazards, which must be addressed.

   c. **Section III Evacuation Procedures.** Lists the procedures that are to be followed during an emergency in order to safely exit your facility. These procedures should not just be talked about. They need to be rehearsed. Fire Drills should occur frequently and without warning. **Since effective Fire Drills can mean the difference between life and death, take them seriously!**

4. **Class Sequence.**

   a. **Student training book review.**

   b. **Post training written test.** A 20-question test will be administered. You can use this student guide and any other notes that you have taken. Following the test you will trade papers and I will review the answers.

   c. **Sign Certificates.** Following the test you will fill out certifications and return along with the test.

   d. **Final Questions.** This is your last opportunity in class for you to ask questions, especially for those questions on the test you may have answered incorrectly. (You can of course ask questions later outside of class!)

Section II Fire Prevention

A. Electrical Safety

1. Grounding/Bonding. Static electricity is always generated whenever two substances make and break contact. A serious hazard can occur especially where low flash point solvents are used. **Bonding and grounding provide a pathway whereby the static charge can travel to the earth.** Bonding provides a means for two charged bodies to be at the same electrical potential. This is accomplished by placing an electrical conductor between two containers, one of which is grounded. Grounding equalizes any charge differential between the container and the ground. **Bonding and grounding are required where flammable and combustible liquids are stored and dispensed. (Q # 5)**

a. The terms *grounding* and *bonding* refer to the attempt to ensure that two containers, both the dispensing container and the receiving container, (and the ground) are **electrically interconnected so as to prevent a spark from being generated.** This spark coming into contact with flammable vapors could produce an explosive effect.

b. The regulations require that all class 1 liquids be grounded. Class 1 liquids are chemicals with flashpoints < 100 deg. F. (Flashpoint is defined basically as the minimum temperature at which a given chemical will emit vapors capable of ignition.). To know this, the MSDS sheet should be consulted to see what the flashpoint is. Once it is determined that a particular chemical requires grounding, then steps should be taken to do so.

c. Although OSHA regulations require that only class 1 flammables be grounded, we strongly recommend that any chemical with a flashpoint of less than 200 deg. F. be grounded. The reason is that chemicals with flashpoints below 200 deg. F., **can still possibly be ignited by a spark generated from static electricity.** Also, as a matter of practicality, it is much easier to require grounding of all labeled "flammables" and "combustibles" rather than always attempting to ascertain the flashpoint. (Many fire departments agree)

d. The regulations do not specify a minimum size that this requirement applies to. That is, there is no specific requirement stating for example "All 5 gallon metal containers or larger" should be grounded. In fact, after conferring with 3 OSHA consultants, it was clear that <u>any</u> size metal container would have to be grounded, if it contained Class 1 liquids.

e. The means by which grounding can be accomplished are varied. First of all, every building should have a grounding source. That is, somewhere in the building there is a metal rod going through the floor and into the ground. If a building does not have this ground, then one should be obtained. Sometimes water pipes can be effectively used as grounds. However, under <u>no</u> circumstances should electrical conduits be used!

f. Once the location of the ground has been established, then a wire must be connected to that ground and routed to wherever the flammable or combustible liquids are stored. If these liquids are in drums, then the ground wires should be directly attached to the drums by way of a clamp. Furthermore, if these liquids were in some sort of metal cabinet, then the cabinet itself would be grounded. (Most metal cabinets designed to hold chemicals have a bolt, whereby a ground wire can be attached). Within the cabinet a wire must be attached to both the cabinet and container, again by way of an "alligator" type clip.

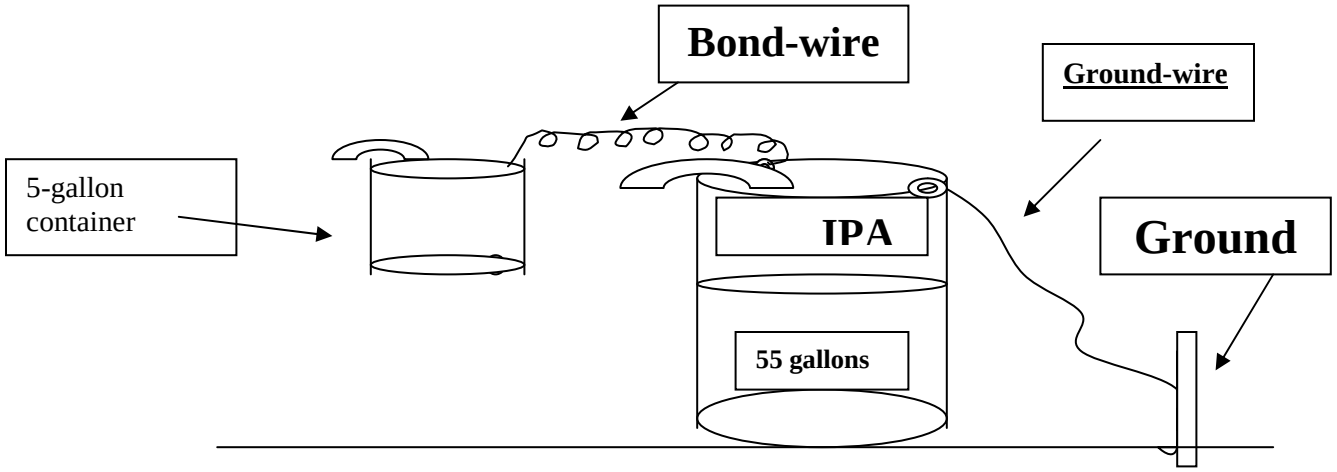
g. Even non-metallic containers must be grounded according to the regulation. Obviously, metallic containers are more likely to generate static electricity. This is why we strongly recommend that at a minimum, all 5-gallon metal cans or larger <u>must</u> be grounded!

h. Grounding is only part of what is required. *Bonding* must also be accomplished. This is done by simply attaching a wire from the dispensing containers to the containers being dispensed into. Whereas 5-gallon metal dispensing containers should be grounded, all metal containers being dispensed into should be bonded.

i. The ground wire you use can be either braided or solid. Braided wire is actually several wires intertwined (braided) together. Braided wire is preferred if you are going to remove the ground wire itself often. This is because braided wire is more flexible

Solid wire is simply wire that, while it may provide a better pathway is not very flexible and repeated use will cause breakage. Use solid wire for wiring that will be for the most part stationary. The gauge of the wire is not as important as it's strength and durability. Also, whether the wire is coated (insulated) or not depends on your situation. Braided wire is better if coated in order to preserve the integrity of the wire. Whereas solid wire is fine uncoated.

F. Grounding and bonding



2. Extension Cords

Many people are somewhat confused as to the proper use of extension cords. The following should hopefully clear up some of the confusion.

(Q # 6)

a. First of all, **extension cords cannot be used in lieu of fixed or permanent wiring.** Obviously, if you have an extension cord attached to a wall, running through walls, or going up and through ceilings, this of course would be a violation. (CFR 1910.305 (g) (H) (iii)).

Therefore, the question is what about the use of extension cords for items such as fans. The answer is you can definitely use extension cords in these circumstances provided you meet the following criteria:

1. If they are temporary (30 days or less, or the equipment is moved during each shift).
2. That you use heavy duty round extension cords and not the "flat" type.
3. Also the extension cord must have a ground plug on it.
4. The extension cord has no cuts, frays or missing parts and that everything is in good working condition.

5. The extension cord must be free of splices. The regulation states that "...flexible cords shall be used only in continuous lengths without splice or tap..."

* The only exception to this is according to the regulation "...Hard service cords NO. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced..."

6. Extension Drop cords must be UL approved and equipped with a ground connector.

7. The extension cord itself presents no trip, or any other type of hazard (i.e. electrical, etc.).

b. If you have a situation where the existing cord on a piece of equipment simply isn't long enough and you need some type of extension, then you might consider the following. Replace the entire length of the cord with a new longer cord.

You can do this provided you ensure that the new cord meets manufacturer's specifications, has a ground plug, and that the work is done by a qualified individual.

c. As many of you know, using extension cords are many times an unavoidable necessity. As mentioned above, there are some fairly strict regulations regarding their use. However, even if you use them properly, recent studies have shown that many extension cords, power strips etc. are faulty or poorly made resulting in many fires and injuries.

The U.S. Consumer Product Safety Commission (CPSC) conducted a study in which they found that electrical cords and plugs caused or helped cause over 7,100 fires in 1996 resulting in 120 deaths. This is nearly 1/3 of all deaths in residential fires! This being the case, it is important that not only does your company need to use extension cords and power strips safely, but also you need to use the proper ones.

d. It may be a good idea to research the best cords and power strips to use. Consumer Reports magazine and other consumer related publications will help you. (Or ask your favorite/trusted sales attendant at Home Depot or Radio Shack and/or your electrician). Remember, you may have a very expensive piece of equipment powered through a $5 dollar power strip. Would it not be worth a little more money for a higher quality power strip, if it meant protecting your valuable equipment?

e. So prevalent is this problem that the CPSC has recalled nearly 25 various types of cords, power strips, surge protectors involving over 2 million actual types of these devices. Many of these cords are cheap devices purchased in discount stores, many of which are produced in China. Some even have bogus 'UL Listed' labels. Remember, if you eliminate to the degree possible all of your electrical hazards, you will go a long way in preventing the number one cause of fires, that being electrical fires.

3. Other Electrical Hazards

A. **Prevent machinery from overheating by keeping them clean and in good working order.** Many times overheated machinery can cause fires. Be sure to be aware of unusual electrical type smells. These could be indications of overheating machinery. Also do not plug machinery or equipment (especially larger items) into multiple outlet plugs, even if it is a "power strip".

B. **Do not use shop rags to change 'Hot Light' bulbs.** The solvent on the rag could ignite when in contact with the hot bulb.

C. **Welding.**

1) Though Section IIA deals with electrical hazards, we will go over fire prevention safety for gas welding as well as arc welding. Obviously before any welding is done, the area in which it is to be done needs to be clear of any hazards. In fact according to CFR 1910.252 (a)(1)(vii) "Where practicable all combustibles (i.e. flammable/combustible liquids, solid combustibles-paper etc.) shall be relocated at least 35 feet (10.7 m) from the worksite". When it is not possible to relocate the combustibles, they must be protected by "flame proofed covers or otherwise shielded with metal or asbestos guards or curtains".

2) Other requirements involved in fire prevention are to ensure that fire extinguishers are available and employees trained in their use. Also, besides fire extinguishers, you may need to have available "pails of water, buckets of sand, hose or portable extinguishers" and these would be determined by "the nature and quantity of the combustible material exposed" (1910.252 (a)(2)(ii).

A fire watch may be necessary should welding take place in areas "where other than a minor fire might develop". A fire watch might also be necessary should the following conditions be met:

(1) Appreciable combustible material, in building construction or contents, closer than 35 feet (10.7m) to the point of operation.

(2) Appreciable combustibles are more than 35 feet (10.7m) away but are easily ignited by sparks.

(3) Wall or floor openings within a 35-foot (10.7m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

(4) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

3) Firewatchers shall have fire-extinguishing equipment readily available and be trained in its use. They shall be familiar with facilities for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the

capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least a half an hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

D. Exposed wiring. Always look for worn or frayed wiring. If you see any, do not use the equipment or cords and report these faulty items to your supervisor.

B. Chemical Safety

1. Vapor Hazards. As mentioned in Section IIA, flammable and combustible liquid vapors are easily ignitable by such ignition sources as static electricity. **But these vapors can be ignited by a variety of ignition sources**, not just static electricity. **(Q # 4)**

a. One of the first things you need to know is exactly what is the flashpoint of a liquid? Basically the flashpoint is the temperature at which a given chemical will give off or emit enough vapor, that if a spark were to come into contact with it, it would ignite.

b. Once we know the flashpoint of a chemical, we can determine if it is a flammable or combustible or neither. First of all, a flammable is a liquid that has a flashpoint of less than 100 degrees F. (for example film cleaner and some press washes). A combustible on the other hand is a chemical that has a flashpoint greater than 100 degrees F. but less than 200 degrees F. (for example most press washes).

c. Chemicals with flashpoints less than 140 degrees F. (film cleaner and most press room solvents) are especially hazardous and would always need to be grounded. For chemicals that do not have flashpoint below 200 degrees F., it is nearly impossible for the fumes or vapors to be ignited. These chemicals in order to burn would need to be pre-heated before they burn.

d. Keep in mind that nearly everything has a flashpoint that is a point where it will burst into flames. For example the flashpoint of paper is 451 degrees F. Below this temperature a simple spark would not ignite paper, but it would ignite a flammable or combustible liquid <u>because</u> of the low flashpoint of the liquid.

e. All chemicals that are flammables or combustibles should be labeled as such. If you see a label that has an HMIS 1-4 rating on it, remember the higher the rating the greater the fire hazard. The following is the HMIS warning for Flammability. (Q #15)

FLAMMABILITY *(Red)*

4	**FLASH POINT BELOW 73 F: This substance is very flammable, volatile, or explosive depending on it's state. Extreme caution should be used in handling or storing of these materials.**
3	**FLASH POINT BELOW 100 F: Flammable, volatile, or explosive under almost all normal temperature conditions. Exercise great caution in storage or handling of these materials.**
2	**FLASH POINT BELOW 200 F: Moderately heated conditions may ignite this substance. Caution procedures should be employed in handling.**
1	**FLASH POINT ABOVE 200 F: This substance must be preheated to ignite. Most combustible solids would be in this category.**
0	**WILL NOT BURN: Substance will not burn.**

f. Also, knowing the Vapor Density is important in handling Flammable and Combustible liquids. The Vapor Density (indicated on the Physical/Chemical Characteristics section of an MSDS) of a chemical indicates whether or not the vapors are heavier or lighter than air.

g. Some MSDS indicate simply Vapor Density = Heavier than air (or lighter than air as the case may be). However some may indicate a number such as 2. Keep in mind that the Vapor Density Scale is simply 1.0 = Air. Therefore if the number is greater than 1.0, then the vapors are heavier than air. Likewise, if the number is less than 1.0, then the vapors are lighter than air.

h. This is important because if you had a flammable liquid with a Vapor Density heavier than air (such as press wash), then the vapors (once they have been emitted from a container) will fall to the ground (because they are heavier than air), and they will move out and **eventually may come into contact with an ignition source** (such as a pilot light in a hot water heater). **(Q # 4)**

2. **Spill Containment.** This area is especially important for flammables, because of the vapor hazard. For example, if a large drum were to leak flammable solvents, the vapors of those solvents can travel relatively long distances to **"seek out ignition sources".** Therefore, because of these spill or leak hazards, it is important to spill contain flammable/combustible liquids effectively. When considering how much to spill contain, the regulations stipulate "100% of the largest container or 10% of the total, whichever is greater". When in doubt ask your supervisor! **(Q # 4)**

3. **Dispensing flammable/combustible liquids.** Besides grounding flammable/combustible liquids, you should pour or mix flammable/combustible liquids (as well as other hazardous liquids in general) **in areas with proper ventilation.** You do not, for example, want to pour/mix hazardous chemicals in cleaning closets or other closed-in areas. Remember, if the vapors of the chemical you work with exceed the OSHA Permissible Exposure Limit (or PEL), then your body may react to this overexposure in a very adverse way.

4. **Incompatible materials.** Be sure to consult the MSDS for any chemical product you use before mixing them with other chemicals. This is because you may inadvertently mix chemicals that may be incompatible with each other and may produce toxic fumes or other such hazards.

5. **Oxidizers.** One such example of ***incompatible materials*** is storing or mixing flammables with *oxidizers*! Oxidizers are types of chemicals that when they go through a reaction or burn they may produce oxygen. Excessive oxygen creates more of a flammable hazard because obviously oxygen is needed to have a fire.

NOTE: There are three things that must be present in order for a fire to start. These are Fuel, Heat (or Ignition source) and thirdly Oxygen. If you do not have all three, then you do not have fire.

6. **Burning chemicals. When chemicals burn they may produce a very toxic fume or smoke. For this reason, it is your company's policy that in a larger-size chemical fire, you should immediately evacuate the area, even though you may have an extinguisher designed to combat chemical fires such as an ABC-type extinguisher** (which we will discuss later in this guide). **(Q # 14)**

7. **Disposal of Flammable/Combustible Liquids.** Obviously you want to dispose of flammable/combustible liquids properly. You should not dispose of these kinds of chemicals in trashcans or pour them down drains. Doing this could lead to explosions and fires. Also, doing this is a felony and may get you and your company in serious trouble.

8. **Container labeling and usage. Always be sure that all containers you use** are properly labeled **with *manufacturer's name, product name* and *an appropriate hazard warning*. (Q# 4)** Also, avoid using old containers. These containers may have old labels on them. Even more importantly, you may pour a chemical into a container that once held an incompatible material. For example, you do not want to pour ammonia into old bleach bottles, because you may produce chlorine gas, which is fatal in large quantities.

C. Housekeeping

1. **Work areas.** Be sure to keep your work areas as clean as possible i.e. clean up any spills/leaks immediately and do not allow trash or debris to build up.
2. **Scrap paper.** Used or shredded paper is an extreme fire hazard. Be sure to keep all possible ignition sources (especially cigarettes) at least 25 feet away. Shredded paper can erupt into a very intense large fire since paper is a perfect combustible solid, and since the paper is surrounded by oxygen (i.e. not tightly stacked or rolled together) it can become nearly explosive. Also, paper dust is a known explosive hazard.

3. **Rag containers. Rag containers should always be kept shut.** This is primarily for two reasons: **(Q # 20)**
   a. One is it violates Air Quality Standards, **because rags soaked with solvent** will emit Volatile Organic Compounds or VOC's, which are highly regulated by the local Air Quality Management District.
   b. **Secondly, rag containers with lids open may allow ignition sources such as sparks to come into contact with solvent soaked rags.**
   c. Also, rag containers should always have lids, and obviously self-closing lids are best. Self-closing metal containers are designed to prevent fires.
   d. The bottom of the cans is vented to hopefully dissipate any heat build up. Heat build up could occur due to spontaneous combustion such as is common with rags soaked with linseed oil.

e. The self-closing lids also help to ensure that the fire, should one break out will be "self-smothered". Rag containers are (according to regulations) to be emptied daily. Empty into larger containers that your "rag supplier" empties for picks up.

NOTE: ***The following is more detailed information concerning the disposal of rags!***

The proper disposal of rags is an issue that is often brought up. For that reason, the following is an attempt to briefly review some of the requirements. The OSHA regulation addressing this question is CFR 1910.106 (e) (iii). This regulation simply states that:

> (iii) Wastes and Residues. Combustible waste material and residues in a building or unit operating area shall be kept to a minimum, stored in covered metal receptacles and disposed of daily.

OSHA normally interprets the above regulation the following way. That is, rag cans near the equipment should be constructed of metal and have a lid. (The self-closing lid is the best practical solution in order to insure that the lid is always closed except when depositing rags.) The lid closing is to prevent sparks or other ignition sources from contacting the solvent-soaked rags, as well as insuring if a fire starts that it will self-smother. This is especially important if the materials stored are known to spontaneously combust.

Also, these containers should be emptied daily into another metal container with a lid (preferably a 55 gallon one) and placed in a designated area. This designated area should be a place that would limit any fire hazards and be marked accordingly. (These markings could be a sign over the top of the container or area outlined with tape on the floor.) The 55-gallon metal container itself must be marked as a waste container with a flammable warning affixed. It would also be a good idea to put a sign on top of the can stating that the lid should be replaced each time rags are deposited in it.
Some companies use plastic rag containers. This is fine if the container is designed to be self-smothering, and the plastic will not deteriorate due to exposure to chemical in the rags.

Also, some companies have containers that are designed to close if the rags catch on fire. These containers have a wire that will melt and cause the lid to fall. This does meet fire regulations, however the bad news is that these containers do not meet Air Quality Standard Regulations.

As mentioned above, solvent-soaked rags will emit Volatile Organic Compounds (VOC's). And doing this will violate all air quality rules. It does not matter if your facility is exempt from permitting, you still must not allow VOC's to be emitted by exposing solvent-soaked rags directly to air.

Another issue that arises is whether printers should use disposable wipes instead of rags. Switching to wipes may solve some problems, they however create others. That is, once a disposable rag is soaked with a hazardous

material it now becomes a ***hazardous waste***. This being the case you must then do a waste determination to see whether or not these wipes can simply go into the trash. Chances are they will not if they have any EPA *listed material* on them or any EPA defined *Characteristic Hazardous Properties* such as flammability, corrosivity, etc.

If they are indeed hazardous, they then must be handled as any other hazardous waste i.e. manifesting etc. Cloth rags that are normally leased to printers (then picked up to be laundered), do not require manifesting. This is one of the advantages that this loophole offers.

Some large companies that use large amounts of rags have invested in solvent-recovery systems in order to save money. The rags are spun in a machine that removes the solvent to be recycled. This option may be cost-effective for your company, if you use a large amount of rags.

Another problem is pressmen like to prop open cans so that they can throw the rags in them without having to get down off the press each time to open the container. Again this is a violation. Pressmen would be better off to use several rags first, and then place them in the rag containers (which should be emptied daily). Do not allow too many rags to pile up outside of the rag containers!

4. **Cigarette materials.** Cigarette butts should always be carefully disposed of. You should always place cigarette butts in proper receptacles. Also, as mentioned previously, smoking should not be done with in 25 feet of flammable/combustible liquids and materials.

D. Smoking

(Q # 7)

1. **Smoking.** As smoking is one of the major causes of fires, care should be taken to minimize this risk. Smoking should always be done in 'designated areas' only. **List exactly where employees are allowed to smoke on company property.**

   _____

   (i.e. inside designated areas, outside designated areas etc.)

E. Inspections. One great way to prevent fires is to routinely inspect your facility and particularly your work areas. Areas you should inspect include (but are not limited to) the following:

1. **Housekeeping.** As mentioned, be sure your area is clean and report other unclean hazard areas to your supervisor.

2. **Exits.** Be sure exits and aisles leading to them in your areas are not blocked. OSHA regulations state that pedestrian aisles are to be clear to at least 24 inches wide. Also, the area immediately in front of an exit must have a 36-inch clearance.

3. **Electrical Panels.** Be sure all electrical panels and equipment switches have at least 36 inches clearance. This is especially important in fire prevention because you might have a piece of equipment shorting out, which could cause a fire. Therefore, you should have easy access to de-energize the malfunctioning equipment.

4. **Emergency Lights.** Be sure these lights work in case of power failure. You can test these lights by depressing the test button that most new emergency light devices have. If bulbs are burned out, report it to your supervisor.

5. **Fire extinguishers.** Be sure fire extinguishers in your work areas (and elsewhere) are not blocked and are accessible. Also do not use a fire extinguisher if you have not been trained to do so (to be discussed latter in this guide). To help you ensure the functionality and accessibility of the extinguisher nearest you, it should be checked no less than monthly (per OSHA regulation). This monthly inspection includes ensuring accessibility, sign over top, checking gauge to see if charged, and that the extinguisher is mounted.

Section III Evacuation Procedures

A. Evacuation Preparation.

1. **Drills.** Drills may be conducted by your company on a periodic basis. Drills will help you to be prepared (be sure that you are familiar with your company's evacuation procedures and that you know the nearest exit and assembly areas**). In fact, our assembly area is located (Q # 17)** _____ . You should participate in these drills as if they were the **real** thing, because in a real evacuation it **is** the law that you must evacuate to your assigned assembly area and **stay there until given the "all clear" by your supervisor (who will be released by the fire authority). (Q # 18)** If you are a supervisor, it is especially important that you inform those employees you supervise of the company's evacuation procedures (as well you must ensure their safe evacuation in a real emergency).

2. **Fire Coordinators.** The following individuals are the fire coordinators for your company. Be sure to inform them as soon as possible in the event of an evident or suspected fire emergency (or any emergency for that matter).

First Shift

Primary Supervisor	**Home Number**	**Cell Number**	**Beeper Number**
_____	_____	_____	_____
Secondary Supervisor	**Home Number**	**Cell Number**	**Beeper Number**
_____	_____	_____	_____

Second Shift

Primary Supervisor	**Home Number**	**Cell Number**	**Beeper Number**
_____	_____	_____	_____
Secondary Supervisor	**Home Number**	**Cell Number**	**Beeper Number**
_____	_____	_____	_____

3. **Local Emergency Contacts.** In the event the fire coordinator is not available or you are designated to notify local authorities etc. the following entities should be notified.
   NOTE: *Be sure you know the actual phone numbers--not just 911. This is because in a major emergency the 911 operator may be inundated with calls and not able to respond!*

Fire Department Name/Co. Designation	**Actual Local Fire Department Phone Number**
_____	_____
Hospital/ER	**Actual Hospital Phone Number**
_____	_____

4. **Know the location of emergency equipment.** Emergency equipment includes (but is not limited to) the following:
   - **a.** Fire extinguishers
   - **b.** First Aid Kits/Emergency Blankets/Stretchers
   - **c.** Eye washes
   - **d.** Alarms/Intercoms
   - **e.** Radios
   - **f.** Spill Kits
   - **g.** Personal Protective Equipment (PPE)

B. Actual Evacuation Procedures

1. **If you see a fire:**
   - **a. Shut down operations and evacuate the immediate area. (Q # 11)**
   - b. Advise the Fire Prevention Supervisor of the emergency.
   - c. If supervisor is not available, sound alarm and notify fellow employees.

2. **If you hear the fire alarm sound:**
   - a. Shut down operations.
   - b. Evacuate the building following the emergency procedures and designated escape routes.
   - c. Immediately report to the designated evacuation meeting area (see assembly area on facility drawing).

3. **Fire prevention supervisor responsibilities:**
   - A. Evaluate characteristic of burning material, such as, explosive, toxic fumes, etc.
   - B. Remove all potential sources of ignition.
   - C. Extinguish fire with proper equipment.
   - D. Cool any nearby containers or materials with water.
   - E. Set-up containment area to prevent fire from spreading.
   - F. If the Fire Prevention Supervisor finds that he is unable to control the fire, he will then give the signal to evacuate the facility as described in the evacuation section.

4. General Evacuation Procedures:

In the event of an emergency in the facility, the Fire Prevention Supervisor will determine if an evacuation will be necessary. It is the responsibility of every manager and department head in the company to insure that the employees under their supervision know how to get out of the building in the event of a fire emergency. An orderly evacuation depends on both an early warning and employee awareness of the proper procedures to follow. While the procedures below apply to all companies, managers must use their own judgment in implementing them. If an evacuation is necessary the following steps will be taken:

A. If an order is given for evacuation, it will be made by the Fire Prevention Supervisor via the Paging System or by personal contact, if paging system is out of order.
B. Any customers or visitors will immediately proceed to the nearest safe exit.
C. All personnel will shut down their present work operation (if time allows and it is safe to do so), and proceed to the nearest safe exit.
D. The Fire Prevention Supervisor will notify the Fire Department, Police Department, and other agencies that are appropriate and inform them that an evacuation is in progress.
E. All personnel shall meet at the designated area for further instructions, and a head count will be taken by the Fire Prevention Supervisor.
F. The Fire Prevention Supervisor will make sure that no one enters the facility until the fire authority has given the clearance.

The above procedures shall be explained to new employees prior to the first workday! Our official Signal for evacuation is _____ (ALARM OR INTERCOM OR BOTH) (Q # 8)

5. How to evacuate a burning building:

a. The last one out of the room should not lock the door, just close it. Locking the door hinders the fire department's search and rescue efforts.

b. Proceed to the exit as outlined in this Contingency Plan.

c. Do not use elevators under any circumstances.

d. Stay low to avoid smoke and toxic gases. The best air is close to the floor, so crawl if you have to.

e. If possible, cover your mouth and nose with a damp cloth to help you breathe. (Not a dirty shop rag!)

6. What to do if trapped in a burning building: (Q # 14)

Rarely do people get trapped in a fire because they can usually evacuate the area. **In a case where you are trapped, here are guidelines for your safety:**

a. If you are trying to escape a fire, never open a closed door without feeling it first. Use the back of your hand to prevent burning your palm. If the door is hot, try another exit. If none exists, seal the cracks around the doors and vents with anything available. (Q # 3)

b. If trapped, look for a nearby phone and call the fire department, giving them your exact location.

c. If breathing is difficult, try to ventilate the room, but do not wait for an emergency to discover that windows cannot be opened. **Also, breathe the air along or near the floor because the smoke will tend to rise! (Q # 9)**

d. DO NOT PANIC - Panic only causes us to make errors in judgment and could result in harming others and ourselves unnecessarily.

e. "Know which rooms have windows" (ascertain which rooms in your facility have windows.)

f. EVACUATE TO A ROOM WITH A WINDOW - Keep the door shut and if available, stuff rags or clothing under the door to keep out smoke and/or toxic gases.

g. OPEN THE WINDOW - At the top to allow the smoke in the room to escape.

h. OPEN THE WINDOW - At the bottom to allow fresh air into the room and to signal for help.

CAUTION - DO NOT OPEN THE WINDOW IF THERE IS SMOKE RISING FROM THE FLOORS BELOW YOU.

("Why?" Because it will draw the smoke into the window from the floors below. Therefore, this would not allow low areas in which to breath.)

i. REMEMBER: Never use an elevator in a fire. Rather always use the stairs! Go down stairs never up! (Q # 16)

7. What to do if clothes catch on fire: (Q # 19)

The basic rule for fire prevention if your clothes are on fire is: STOP, DROP and ROLL. **(Q # 13)**

STOP -stop moving or running.

DROP -drop to the ground with your arms on your chest.

ROLL -roll on the ground or floor and if available use a rug or carpet to roll up in.

COOL -if you are burned, the immediate care for first and second degree burns is to cool them with water. If you have sustained third degree burns, consult with medical personnel.

"If you see someone on fire, force them to the ground if you have to and use a blanket or jacket to smother the fire."

8. First aid procedures:

Treatment of Burns

The following information details the three degrees of burns and how to treat them. Remember it is extremely important to get burned individuals immediate medical attention. Minutes are critical!

First Degree Burns

SIGNS: Redness of the skin, pain and minor swelling.

TREATMENT: Apply cool water or submerse in cool, fresh water. Do not use ice water or salt water. You can continue this treatment until the pain is relieved. Leave the burned area uncovered.

Second Degree Burns

SIGNS: Deep red skin. Shiny, glossy appearance with leaking fluid. Loss of skin and blisters.

TREATMENT: Immerse in fresh, cool water, not ice water or salt water. Continue for 10-15 minutes. Dry with a clean cloth and cover with sterile gauze. Do not break blisters. Further medical treatment is required.

Third Degree Burns

SIGNS: Loss of skin layers. Painless. Skin is dry and leathery. Possible charring of skin edges. Third degree burns are often surrounded by patches of first and second degree burns.

TREATMENT: Cover the burned area with gauze or a soft cloth. Do not use a material that will leave lint on the burned area. If the face is burned, have the person sit up to insure ease of breathing. If at all possible, the burned area should be elevated higher than the head. Keep the person warm and comfortable and be aware for signs of possible shock. Medical attention is required immediately.

The signs of shock and treatment are:

1) Early Stages

a) Skin is pale (or bluish) and cold to the touch.
b) Skin may be moist and clammy if perspiration has occurred.
c) Victim is weak.
d) Pulse may be rapid (over 100) and may be too faint to be read at the wrist.
e) Breathing rate is normally increased; also it may be shallow, perhaps deep and even irregular.
f) If burn is in chest or abdomen (especially if these areas also were exposed to blows or other injury), breathing will most certainly be shallow because of difficulty in breathing due to pain.

g) Vomiting or retching due to nausea.

2) Late Stages

a) Victim may become apathetic and unresponsive.

b) Victim's eyes may appear sunken with pupils dilated significantly. They may also appear to have a blank stare and be expressionless.

c) Skin may appear mottled due to blood vessels being congested indicating low blood pressure.

d) Victim will ultimately lose consciousness if not treated. Body temperature will fall, resulting in possible death.

3) First Aid (until emergency help arrives)

a) The overall objectives are to improve the circulation of blood, ensure an unrestricted access to oxygen and keep victim as close to normal body temperature by either keeping them warm by covering them with blankets or cooling them using cool wet rags/clothes, etc.

b) The position of the victim's body would always depend on the type of injuries (besides burns). However, the ideal position is lying flat in order to promote a proper blood circulation.

c) Raise victim's feet 8-12 inches off the floor to improve blood flow. However, observe whether or not breathing becomes difficult once feet are raised. Obviously, if breathing difficulties increase due to raising the feet, then lower them.

d) Keep victim warm by using dry blankets, etc. Avoid overheating as this may cause other problems.

e) Fluids should only be given if medical help is more than an hour away. This is because fluids could complicate the victim's condition. If fluids must be given, do so in small amounts (i.e. 4 oz. Every 15 minutes…less for smaller children and infants) ensuring that the water is neither hot or cold! Also, closely observe to see if victim is becoming nauseated, etc.

f) Do not administer fluids if victims are unconscious.

9. Fire extinguisher procedures:

a. Do not attempt to fight a fire if:

1) "If you are not trained or do not know how to use a fire extinguisher then do not attempt to fight the fire at all!" Also:

a) If the fire is spreading beyond the spot where it started.

b) If you can't fight the fire with your back to an escape exit. (Q # 12)

c) If the fire can block your only escape route.

d) If you don't have adequate fire fighting equipment or training.

e) If there is a possibility that the substance burning could be producing toxic vapors.

b. Types of extinguishers:

1) Fire extinguishers are classified on the basis of what types of fires they are most effective in handling:

NOTE: Some extinguishers are marked with multiple ratings such as AB, BC, and ABC. These extinguishers are capable of putting out more than one class of fire.

- **CLASS A: Should be used for fires involving ordinary combustible materials such as paper, wood, and textiles. (Q # 2)**

- CLASS B: Should be used for fires in flammable materials such as film cleaner, gasoline, press wash, oils, lacquer thinner, paints, and greases. (Do not fight large chemical fires.) **(Q # 14)**
- CLASS C: Should be used for fires in electrical equipment**. (Do not use water extinguishers on energized electrical equipment) (Q # 10)**

- CLASS D: Should be used for fires involving metals.

c. Training:

4. First of all, if you have not been trained on how to use extinguishers, then you are not authorized to use them.
5. Secondly, fire extinguisher training will be conducted for a select group of employees.
6. The fire department, a fire extinguisher charging/servicing company or a knowledgeable employee may do this training.

d. Tips on how to use a fire extinguisher:

1) Pull safety pin and twist to break plastic cord seal.
2) Aim nozzle, horn or hose at the base of the fire.
3) Squeeze trigger handle gently with finger.
4) Sweep nozzle side to side at base of flame.
5) Carry in upright position.
6) Have a back up fire extinguisher ready.
7) Fight with back to exit.
8) Set a "Re-flash Watch" on a fire you just put out to ensure that it does not re-ignite.

Fire Prevention Training Test

Name: _____

Date: _____

Dept.: _____

*** Some answers depend on your facility's policies and/or procedures**

1. Most fires are caused by; (Sec. I.A.1.a.)(p. 3)
a. Flammable chemicals
b. Spontaneous combustion
c. Careless Arsons
d. Electrical sources

2. Grounding and Bonding will (Sec. II.A.1.a.)(p. 5)
a. Help prevent the buildup of static electricity.
b. Promote World Peace
c. Help prevent flammable liquids from igniting.
d. A & C

3. Extension Cords should (Sec. II.A.2.a.)(p. 7)
a. Not be used as a substitute for fixed wiring.
b. Be used as much as possible since they have ground plugs.
c. Be no longer than 25 feet
d. A & C

4. Containers used to hold flammables and combustibles should be (Sec. II.B.1.,B.3.,B8)(p.10-12)
a. Stored in well ventilated areas
b. Clearly and correctly marked
c. Stored away from ignition sources
d. All of the above

5. In our company smoking is only allowed (Sec. II.D.1)(p. 15)
a. Outside in designated areas
b. Inside in designated areas
c. On the roof
d. Both A & B

6. If you hear the fire alarm sound (voice or intercom) and you have no specific fire responsibilities, you should (Sec. III.B.1.a.)(p. 18)
a. Shut down operations, evacuate through designated escape routes to the evacuation meeting area.
b. Wait to see if it is only a fire drill.
c. Close windows, doors, then call the fire department.
d. B & C

***7.** In our company the official warning system for fires is (Sec. III.B.4.)(p.19)
a. Alarm
b. Intercom or voice
c. Flames
d. Both B & C

***8.** During a fire, if I come upon a closed door that I need to get through I should (Sec. III.B.6.a.) (p. 20)
a. Use my foot to kick open the door
b. Reach out with the back of my hand to see if I feel heat.
c. Put my tongue on the doorknob to see if it is hot.
d. Open the door slowly to ensure that there is no fire behind it.

9. In a smoke-filled room, it is best to breathe the air (Sec. III.B.6.c.) (p. 20)
a. Near the ceiling
b. Near the walls
c. Near the floor

10. If your clothing catches on fire you should (Sec. III.B.7.)(p.21)
a. Drop, Stop, and Blow!
b. Run as fast as you can in order to extinguish the flames.
c. Ensure your medical insurance covers burns.
d. Stop, Drop, and Roll!

11. Do not attempt to fight a fire (Sec. III.B.9.a.)(p. 24)
a. When the fire is spreading beyond the spot where it started.
b. If the fire can block your only escape route.
c. Unless it is worth using an expensive extinguisher.
d. Both A & B

12. A-type fires are (Sec. III.B.9.b.1.) (p. 24)
a. Metal
b. Kryptonite
c. Paper, wood
d. electrical

13. Water base extinguishers should never be used on _____ fires. (Sec. III.B.9.)(p. 214)
a. Electrical
b. Wood
c. Paper

14. Chemicals that have a 4 flammability rating (HMIS/NFPA) are not likely to ignite from sparks alone. (Sec. II.B.1.e.)(p.11) **True** **False**

15. If a large quantity of Flammable/Combustible liquids catches on fire, all I need to make sure of is that I use a B-type fire extinguisher. (Sec. II.B.6.9)(p. 12 & 24) **True** **False**

16. Never put solvent soaked rags in a close metal container. (Sec. II.C.3.a-e.) (p. 13) **True** **False**

***17.** Our assembly area is located_____ (Sec. III.A.1.)(p. 16)

18. Do not re-enter the building (after an evacuation) until the "All Clear" signal is given by the responsible authority. (Sec.III.A.1.)(p. 16) **True** **False**

19. If you are in a building with an elevator when a fire breaks out, use the elevator to exit the building since it will protect you from the flames. (Sec. III.B.6.i.)(p. 20) **True** **False**

20. In the event of a fire, always go upstairs through the stairwell , even if there is no fire below, because heat rises! (Sec. III.B.6.i.)(p. 20) **True** **False**

Fire Prevention Training Certification *(SAMPLE)*

I ___*John Doe*_____, hereby certify that on __*Jan.1, 2000*___, the company provided me with training on fire safety, proper evacuation procedures, and the fire hazards of the materials and processes to which I am exposed as required by OSHA Regulations 29 CFR 1910.38.

I fully understand the material and instructions provided, and I intend to follow the established procedures.

EMPLOYEE NAME	**DATE EMPLOYED**	**DEPT.**
__*John Doe*_____	_*Jan. 1, 1990-Jan 1, 2000*_	__*Pressroom*__

John Doe_____
Employee Signature

Jane Doe_____
Program Coordinator

James G. Harris_____
ACS Representative Signature
(Only applies if training conducted by ACS)

Appendix A Site Plan

Place your company's site plan here!

Appendix B Fire Extinguisher Procedures

Extinguishers should only be used on small fires by employees trained on those extinguishers. Larger fires, especially chemical fires, should not be extinguished by employees, since they are not properly equipped with respiratory protection to fight fires, where there is a danger of breathing toxic fumes. Also, situations where a fire extinguisher should not be used are:

1. If the fire is spreading beyond the spot where it started.
2. If you can't fight the fire with your back to an escape exit.
3. If the fire can possibly block your only escape route.
4. If you don't have adequate fire fighting equipment or training.
5. Again, if there is a possibility that the substance burning could produce toxic vapors/fumes.

Once you have properly placed your extinguisher, and determined when, or if they should be used, the next step is to train employees in their use. Training should include:

1. When to fight a fire.
2. When not to fight a fire.
3. What type of extinguisher should be used and how to use them.
4. Hazards of fighting fires.

When training your employees on the different types of extinguisher, you will instruct them on the 4 basic types, A B C D. These are defined as follows:

A Type- Should be used for fires involving ordinary combustible materials such as paper, wood and textiles.

B Type- Should be used for chemical fires of flammable liquids such as press wash, film cleaner, gasoline, oils, lacquer, thinner, paints and greases.

C Type- Should be used for fires in electrical equipment. Do not use water-based extinguishers on energized electrical equipment.

D Type- Should be used for fires involving combustible and molten metals

Once it is determined that a fire will be extinguished, use the following procedures when using the fire extinguisher:

Use the **P.A.S.S.** Method

P. Pull the pin that unlocks the operating lever.

A. Aim low. Point the extinguisher nozzle or hose at the base of the fire.

S. Squeeze the lever above the handle to discharge the extinguishing agent. To stop the discharge, release the lever.

S. Sweep the nozzle or hose from side to side. If the fire is going out, move carefully toward the flames, keep the extinguisher aimed at the base of the fire, and sweep back and forth. Once the fire goes out, watch the fire area and be prepared to repeat the process if the fire reignites.

Appendix C Fire Extinguisher Placement

When considering fire extinguisher placement the Federal and California Regulations essentially require the same thing and that is: (CFR 1910.157 (d) (1-5) and California GISO 6151 (d))
(1)“Where portable fire extinguishers are provided for employee use, they shall be selected and distributed based on the classes of anticipated work place fires and on the size and degree of hazard which affect their use.”
(2) “The employer shall distribute portable fire extinguishers for use by employees on Class A fires (i.e. paper, wood natural material solids) so that the travel distance for employees to any extinguisher is 75 feet or less.”
(4) “The employer shall distribute portable fire extinguishers for use for by employees on Class B fires (i.e. flammable and combustible liquid fires) so that the travel distance from the Class B hazard area to any extinguisher is 50 feet or less.”
(5) “The employer shall distribute portable fire extinguishers used for Class C (i.e. electrical type fires) hazards on the basis of the appropriate pattern for the existing Class A or Class B hazards.”

The best way to address this fire extinguisher placement issue is to use ABC-type extinguishers in the same room where any flammable or combustible liquids are stored and within no more than 50 feet.
Be sure to have more than one extinguisher available in areas where there are larger quantities of flammable and combustible liquids.

Also, consider the use of Halon extinguishers, which, as you probably are of, will extinguish an electrical fire while minimizing damage to expensive electronic equipment.

Fire extinguishers should be mounted in accordance with NFPA Standard No. 10 (Portable Fire Extinguisher) Extinguishers less than 40 pounds should be mounted not more than 5 feet above the floor. For extinguishers greater than 40 pounds, they should be mounted no more than 3.5 feet above the floor. In either case extinguishers should never be mounted less than 4 inches above the floor.

Appendix D Flammable/Combustible Storage

There seems to be much confusion concerning flammable storage as it relates to how much can be stored on site etc. The following information will address the basic issues concerning the regulatory requirements for flammable storage.

The regulation addressing such issues is Federal Regulation CFR 1910.106 (e) (2) (ii) (b) (1-3) (For California it is found in GISO Article 142 rule 5545) and it states the following:

(b) "The quantity of liquid that may be located outside of an inside storage room (i.e. flameproof room) or storage cabinet in a building or in any one *fire area* of a building shall not exceed:
(1) 25 gallons of Class IA liquids in containers and
(2) 120 gallons of Class IB, IC, II, or III liquids in containers and
(3) 660 gallons of Class IB, IC, Class II or III liquids in a single portable tank.

(Review the *Flammable and Combustible Liquid Classes* chart. It should help you determine the different classes of flammable based on the flashpoint which is given on the MSDS for any given chemical product.)

For example, if the chemical in question was "Cyrel" Washout Solution, which has a flashpoint of 120 degrees F, it would be consequently classified as a Class II Combustible liquid. Therefore, the maximum allowed to be stored is 120 gallons. If you had (7) 55-gallon drums (which has a maximum capacity of 385 gallons), you therefore, must store these drums in a flameproof room (i.e. inside storage room) because they exceed the 120-gallon limit.

However, you may have some options rather than constructing a flameproof room. These are:

1. Reduce the on-hand quantity to no more than (2) 55-gallon drums. Utilize a *Just in Time* (JIT) method of storing these chemicals.
2. Place chemicals in an approved portable storage tank. Portable storage tanks according to the regulation can hold a maximum of 660 gallons outside an inside storage room. This is equivalent to (12) 55-gallon drums.
3. Store these drums in an outside storage building.

The Storage Building regulations CFR 1910.106 (d) (6) (ii) (b) (And for California Article 141 rule 5542) state that:

(ii) " A maximum of 1,100 gallons of flammable or combustible liquids may be located adjacent to buildings located on the same premises and under the same management provided ...(b). Where the quantity stored exceeds 1,100 gallons... a minimum distance of 10 feet between buildings and nearest container of flammable or combustible liquid shall be maintained"

These outside storage buildings must have a leak proof roof, 100 percent spill containment and protection against tampering or trespassers as well as kept free of debris, weeds etc.

4. Also, you could store 55-gallon drums in storage cabinets, but this option is limiting and costly because of the following regulation found in CFR 1910.106 (d) (3) (And for California Article 141 rule 5533) which briefly, states:

"...not more than 60 gallons may be of Class I or Class II liquids, nor more than 120 gallons of a Class III liquids may be stored in a storage cabinet " Furthermore, NFPA regulations (And California) state that " Not more than three such cabinets may be located in a single *fire area*, except that in an industrial occupancy additional cabinets may be located in the same fire area if the additional cabinet, or group of not more than three cabinets, is separated from any other cabinets or group of cabinets by at least 100 feet"

(*Fire Area* is defined by NFPA rules and California GISO Article 134 rule 5415 as " An area of a building separated from the remainder of the building by construction having a fire resistance of at least one hour and having all communicating openings properly protected by an assembly having a fire resistance rating of at least one hour.)

FLAMMABLE AND COMBUSTIBLE LIQUID CLASSES

	CLASS	*FLASH POINT*	*BOILING POINT*	*HMIS CODE*
Flammables	IA	< 73° F	< 100° F	4
	IB	< 73° F	≥ 100° F	4
	IC	≥ 73° F and < 100° F	--	3
Combustibles	II	≥ 100° F and < 140°	--	2
	IIIA	≥ 140° F and < 200° F	--	2
	IIIB	≥ 200° F	--	1

NOTE:

- The class of a liquid can change due to contamination
- Classifications do not apply to mixtures
- Volatility of liquids increase when heated
- Classifications are based on information from OSHA 29 CFR 1910.106 (a)(18)

The chart below outlines the maximum cabinet storage capacities for various liquid classes;

Liquid Class	*Maximum Storage Capacity*
Flammables/Class I	60 gal.
Combustible/Class II	60 gal.
Combustible/Class III	120 gal.
Combination of Classes	120gal.*

* Not more than 60 gallons may be Class I and Class II liquids, nor more than 120 gallons of Class III liquids may be stored in a storage cabinet. OSHA 29 CFR 1910.106(d)(3) and NFPA 30 Section 4-3.1.

Note: Not more than three such cabinets may be located in a single fire area, according to NFPA 30 Section 4-3.1 (or the exception is that they must be at least 100 feet apart)

The following chart lists the maximum allowable container size depending on the type of container based on the flammability class of your chemical;

MAXIMUM ALLOWABLE SIZE OF CONTAINERS AND PORTABLE TANKS

	flammable liquids			*combustible liquids*	
Container Type	*Class IA*	*Class IB*	*Class IC*	*Class II*	*Class III*
Glass or approved plastic	1 pint	1 quart	1 gal.	1 gal.	1 gal.
Metal (other than DOT drums)	1 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Safety Cans	2 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Metal drums (DOT specification)	60 gal.	60 gal.	60 gal.	60 gal.	60 gal.
Approved portable tanks	660 gal.	660 gal.	660 gal.	660 gal.	660 gal.

Appendix E Fire Drill Procedures

To best way to ensure that employees know what to do in the event of an emergency evacuation is to have a fire drill. Though you may realize this, chances are your company may have never conducted a drill. The reasons for not having conducted fire drills are obvious, that is …no time to do them or no real idea how to or what to expect. Nevertheless the regulations require that training be conducted for the safe evacuation of employees (CFR 1910.38 a & b). In order for you to plan to conduct a fire drill we have compiled the following list of considerations. Much of the information is designed to facilitate an orderly evacuation of your facility. Your own unique situation will require you to plan accordingly. If you have any questions or would like us to review your plan please contact us!

Prior Coordination:

1. *Head count sheets*: Produce a Fire Drill personnel accountability roster. If possible put everyone's name on a one page sheet divided by Department. (This way if only one roster manages to make it to the Assembly Area (AA) at least there will be a company-wide roster available. Post these rosters in prominent areas and distribute them to key supervisors. Date each roster and update on a monthly or bi-monthly basis.
2. *Contact Alarm Company:* To insure that they are aware of the drill at least a day before you conduct the drill. It would probably be a good idea to call them just prior to conducting the drill.
3. *Ensure Alarm Deactivation*: Ensure you or whoever conducts the drill knows exactly how to deactivate the alarm following the drill.
4. *Notify receptionist*: Let her know ahead of time about the drill. Also it may be a good idea to have the receptionist stay put in order to monitor the phones in case the Fire Department or Police Department calls in reference to the alarm.
5. *Inform Key People*: Inform your supervisors, sales people, safety committee members etc. about the drill to make sure there is no major conflict. Obviously notify as few as possible people of the drill in order to make it more realistic.
6. *Provide Stop watches*: Provide stop watches to Fire Monitors in order to time the event i.e. when certain departments are evacuated as well as the overall time for the entire drill.

Assign Roles and Responsibilities:

1. Assign Fire Monitors for each area or department. They will ensure area (including restrooms) are clear of personnel.
2. Assign at least two Fire Prevention Supervisors for the company (plus alternates)
3. Assign the specific personnel who will call 911. (Be redundant assign 3-4 people)
4. Assign someone to retrieve the MSDS book (if safe to do so) to give to Fire Response Personnel. (1-2 people)
5. Individuals who will maintain and complete the checklist for the evacuation drill i.e. timing the event and making observations.
6. Which individuals will be responsible for retrieving the first aid kits, emergency blankets (for someone who's' clothing may be on fire), flashlights etc.
7. Individuals who will take their cell phones to the AA in case communications are not possible through the internal phone system.
8. Ensure the fire monitors and fire prevention supervisors know where they are going to be stationed, i.e. outside in AA or in front of building to meet incoming emergency responders.
9. Assign someone to be posted in front of building to ensure that no one enters the front door. (Make sure this person is accounted for)
10. Who will retrieve the visitor's book. This should probably be the receptionist or whoever is watching the front reception area at time of evacuation. If the receptionist is going to remain to answer phones (during drill only not actual evacuation) she should maintain the sign in book. If it is an actual emergency the receptionist should be responsible to account for visitors and notifying the fire prevention supervisor in the AA that visitors are or not accounted for.
11. Who will be assigned to assist any handicapped or disabled employees/visitors.
12. Assign someone (safety committee member etc.) to ensure that the evacuation signs are maintained and updated as necessary.
13. Who are the employees specifically trained and authorized to use fire extinguishers. These employees should know exactly what kind of extinguisher to use and when.

Key Points and Recommendations

1. Start the clock (timing of the event) at the first sounding of the alarm. The clock stops when all managers have informed the fire prevention supervisor in the AA that all employees are accounted for.
2. Each area should be evacuated within 30-45 seconds max. after the alarms sounds.
3. Fire monitors should have completely checked and cleared area in at least 1 to 1 1/2 minutes max.
4. At 2 1/2 to 3 minutes managers should have completed accounting for personnel.

5. At 3 1/2 to 4 minutes max. managers should have given the Fire Prevention Supervisor the 'all accounted for' signal.
6. Make sure all key people know not to call 911 in the event of a drill and these people should be specifically designated.
7. Always have an After Action Review with the safety committee where they will turn in their completed checklist/scoresheet (indicating times and observations).
8. Managers and department supervisors should know who the fire monitors in their respective departments are so that they may be accounted for.
9 Create a Fire Evacuation Handbook, which contains Personal Roster, names of fire monitors and supervisors as well as procedures. Place these in each department!
10. One fire prevention supervisor should be at the Assembly Area (AA) and one should be supervising evacuation. The supervisor at the AA is the one the managers are going to give the 'all accounted for' indication.
11. Maybe 3 way "walkie talkies" might good to utilize. One for fire supervisor supervising evacuation, one for the fire supervisor in the AA, one backup, perhaps for the receptionist.
12. Maybe paint lines or put up a sign indicating the exact evacuation (AA) areas. Draw a large circle or square in the parking area informing employees to stay within that area.
13. Do not allow smoking during drill and definitely not in the event of and actual emergency.
14. To initiate fire drill do a role play where you tell an employee that he/she has just witnessed the outbreak of a fire and for them to sound the alarm etc.

OTHER EVENTS THAT SHOULD BE PLANNED FOR

1. Tornado or high winds.
2. Power Outages.
3. Floods or heavy rains.
4. Hazardous Spills. (In this case make sure AA is not downwind etc.)
5. Earthquakes. (Should not evacuate until after earthquake, shut off natural gas and electricity as necessary.)
6. Bomb threat or threatened employee violence.

SAMPLE EVACUATION ROSTER

Name	Position	Fire Monitor	off work	*at lunch	*on Del/sales call	accounted for
John Doe	pressman	yes	no	yes	no	yes

- **may return from sales call, delivery or lunch during drill or actual evacuation.**

Again the above information is intended to help you in planning and executing a successful fire drill. These are recommendations only! You may modify them to your own particular needs. We will be happy (and would appreciate) the opportunity to review any plan you design in order to make further recommendations or simply for our own benefit and records.

FIRE EVACUATION CHECKLIST (OBSERVATION AND SCORE SHEET)

Name of Fire Monitor: _____ Date/Time of Drill _____

1. Did everyone recognize alarm signal? yes no
*** COMMENTS**

2. Did employees respond immediately? yes no
*** COMMENTS**

3. Was evacuation orderly or was there confusion? yes no
*** COMMENTS**

4. Was equipment shutdown? yes no n/a
*** COMMENTS**

5. Did supervisors for your department conduct headcount and give 'all accounted for' signal to fire supervisor?
yes no
*** COMMENTS**

6. Did you time the event? yes no
-How long to clear individual areas.
-How long to react 1 second, 5 sec., 15 sec. ?

7. Was 911 called? yes no unknown
*** COMMENTS**

8. Were emergency supplies brought to AA i.e. first aid kit, blanket, flashlights etc.? yes no unknown
*** COMMENTS**

9. Were handicapped or disabled employees aided in the evacuation? yes no
*** COMMENTS**

10. Was smoking observed during drill? yes no
*** COMMENTS**

11. Were there at least 3 cell phones outside available in AA? yes no unknown
*** COMMENTS**

Appendix F 'Roll Call' Procedures

As you can imagine in an actual fire evacuation there may be a lot of confusion. **Therefore it is important that you have your 'Roll Call' procedures firmly established**. This is to ensure that all employees and individuals in your facility are accounted for. To do this everyone must know exactly where the evacuation assembly area is located. Also, it may be a good idea, especially if your company is large, to have a roll call sheet or accountability roster. This roll call sheet or roster is a current listing of all employees. This list may be further divided into departments i.e. press, pre-press etc., if department supervisors will be counting their employees. Also, if you have a guest registry or visitors log book at your reception desk, then the receptionist should take it to the evacuation point to ensure that not only employees are accounted for, but also visitors, guests, outside contractors etc. are accounted for!

Appendix G OSHA Accident Notification Procedures

Accidents in our industry are an ever-present concern. Our programs and your diligent participation in implementing them go a long way to hopefully preventing serious accidents. However, we must assume that some day a serious accident may occur at your facility. Therefore, it is obviously prudent to be prepared for such an eventuality.

This is a brief description of the actions you should take following a severe accident. In the following information is article we will not address preventive measures for avoiding accidents, but steps to take in case one occurs.

First of all I will cover the Federal guidelines for accident notification. These regulations are found in CFR 1904.8 (a) through (d) which states the following:

(a) "Within 8 hours after the death of any employee from a work-related incident or the in-patient hospitalization of three or more employees as a result of a work related incident, the employer of any employees so affected shall orally report the fatality/multiple hospitalization by telephone or in person to the Area Office of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, that is nearest to the site of the incident, or by using the OSHA toll-free central telephone number, ((800) 321-6742)

(b) This requirement applies to each such fatality or hospitalization of three or more employees, which occurs within thirty (30) days of an incident.

(c) Exception: If the employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under paragraphs (a) and (b) of this section, the employer shall make the report within 8 hours of the time the incident is reported to any agent or employee of the employer.

(d) Each report required by this section shall relate the following information: Establishment name, location of incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.

Therefore to summarize subsection (a) it states that when a fatality occurs or 3 or more employees are injured (requiring hospitalization), you must notify OSHA via toll free number within 8 hours of the accident. Subsection (b) means that though neither a death nor hospitalization of 3 employees initially occurred, if these occurrences do indeed happen within 30 days of an incident (accident) then notification, must be made within 8 hour by the employer upon learning of them.

Now of course the various states have different reporting criteria. (I.e. Oregon, Washington, California etc.). In the case of California the requirements are far more stringent. California's procedures for 'Reporting Work-Connected Fatalities or Serious Injuries' is found in section 342 (a) where it states:

(a) Every employer shall report immediately by telephone or telegraph to the nearest District Office of the Division of Occupational Safety and Health any serious injury or illness, or death, of an employee occurring in a place of employment or in connection with any employment. (Look in the blue pages of your local phone book in the state government section to find the phone number of your local Cal-OSHA office)

Immediately means as soon as practically possible but no longer than 8 hours after the employer knows or with diligent inquiry would have known of the death or serious injury or illness. If the employer can demonstrate that exigent circumstances exist, the time frame for the report may be made no longer than 24 hours after the incident.
Serious injury or illness is defined in section 330 (h), Title 8, CCR.

(b) Whenever a state, county, or local fire or police agency is called to an accident involving an employee covered by this part in which a serious injury, or illness, or death occurs, the nearest office of the Division of Occupational Safety and Health shall be notified by telephone immediately by the responding agency.

(c) When making such a report, whether by telephone or telegraph, the reporting party shall include the following information, if available:
  (1) Time and date of accident.
  (2) Employer's name, address and telephone number.
  (3) Name and job title, or badge number of person reporting the accident.
  (4) Address of site of accident or event.
  (5) Name of person to contact at site of accident.
  (6) Name and address of injured employee(s).
  (7) Nature of injury.
  (8) Location where injured employee(s) was (were) moved to.
  (9) List and identity of other law enforcement agencies present at the site of accident.
  (10) Description of accident and whether the accident scene or instrumentality has been altered.

(d) The reporting in (a) and (b) above, is in addition to any other reports required by law and may be made by any person authorized by the employers, state, county, or local agencies to make such reports.

As you can see California's requirements are more narrowly defined and stringently enforced. Now keep in mind the fact that, just because you may not have to report directly to OSHA does not mean that they will not be notified. In fact most of the time Firemen and/or Paramedics etc. will notify OSHA in the event of any serious accident.

So do not think that since you did not call, that they will not pay your facility a visit. Also, as is sometimes the case your situation or accident may not be a clear case where you should clearly notify OSHA. When in doubt you might want to notify them regardless. Obviously you can call us and we can recommend a course of action, however, should an incident occur on the weekend or late at night you may not be able to contact us directly. Make sure there is someone with the authority and knowledge to make the call if necessary (including night shift managers etc.)

As in the case of any accident that might prompt a visit from OSHA, review your last walk through checklist that we conducted and concentrate on turning all no's to yes's. (Especially those bolded items on the walk through checklist)

Also, be sure to look at those regulatory areas that may be seen a possible causes of accidents. For example if an employee is injured while working on a press (such as getting a hand caught in rollers) review your guarding and Lockout/Tagout program and procedures. If the injury is a chemical burn to the hand then review you Hazardous Communication Program and training as well as your PPE program, training and equipment availability. If the injury took place during and evacuation either real or drill, review your emergency evacuation procedures.

Another state whose requirements differ from the Federal is Oregon. The Oregon regulations are found in Oregon rules 437-001-0052, which states:

"Employers shall inform the Administrator (or designee) of all fatalities or catastrophes within 8 hours, and accidents or injuries resulting in a hospital admission with medical treatment other than first aid within 24 hours after the employer receives notification."

Furthermore rule 437-001-0053 "Preserving the Fatality or Catastrophe Scene" states:

"Employers, their representatives, or others shall not disturb the scene of a fatality or catastrophe other than to conduct the rescue of injured persons until authorized by the Administrator (or designee), or directed by a recognized law enforcement agency."

Washington State as well has a variation of the Federal standard and it is found in Washington regulation WAC 296-24-020 (3) (a) which reads:

(a) Within eight hours after the fatality or probable fatality of any employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected, shall orally report the fatality/multiple hospitalization by telephone or in person to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.
    (i) This requirement applies to each fatality or hospitalization or two or more employees which occurs within thirty days of the incident.
    (ii) Exception: If the employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time the incident is reported to any agent or employee of the employer.
    (iii) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.

(b) Equipment involved in an incident resulting in an immediate or probable fatality or in the in-patient hospitalization of two or more employees, shall not be moved, until a representative of the department investigates the incident and releases such equipment, except where removal is essential to prevent further incident. Where necessary to remove the victim, such equipment may by moved only to the extent of making possible such removal.

(c) Upon arrival of the department's investigator, employer shall assign to assist the investigator, the immediate supervisor and all employees who were witnesses to the incident, or whoever the investigator deems necessary to complete the investigation.

As with any serious accident that is recordable, notate that incident on your OSHA 200 Form (See January 1999 newsletter for more details). Also, complete an incident report detailing the reasons for the accident etc. This is especially important in California, Washington, and Oregon where there are Accident or Injury/Illness Prevention Programs that require internal accident investigations.

To summarize (briefly) the requirements for states following the Federal guidelines (i.e. AZ, CO, TX, NM, NV, UT).

* After a fatality or 3 or more employees are hospitalized notify OSHA within 8 hours.

For California:

- In the event of a fatality or injury serious enough to require Paramedic attention or ambulance evacuation, notify within 8 hours.

For Oregon:

- Must notify within 8 hours of fatality or catastrophes. Also to notify within 24 hours of any accident/Illness requiring hospitalization for treatment beyond first aid.

For Washington:

- In the event of a fatality or probable fatality notify within 8 hours also if 2 or more employees require in-patient hospitalization, then notify within 8 hours.

Remember you can receive severe penalties for failure to notify OSHA in a timely manner. If it is a severe accident you can count on the paramedics or hospital staff notifying OSHA. Therefore there is no sense in delaying notification because you think it might give you more time to ‘clean things up a bit’ before they might visit!

Appendix H "You Are Here" Signs

One issue, that is constantly being brought up is that of what we here at ACS call "You are here" signs. These are, as the name implies, 'evacuation route maps' that reference the location of the person reading the map in relation to the nearest exit. The requirements for these signs are vague and sometimes hard to understand. The following information will hopefully make the requirements as simple and understandable as possible.

First of all, these signs are part of your Fire Prevention Program and Emergency Action Procedures. These are absolutely required where employees physically cannot see the exit that leads immediately outside. However, they are not specifically required in small print shops or areas where the outside exit door is obviously visible.

We here at ACS strongly recommend however, that you place these maps throughout your facility in order to help you comply with other regulations such as emergency evacuation training, which is required in written form for companies with more than 10 employees. (Emergency Action Plan). Those with less than 10 employees can communicate this orally, though documenting this is of course in your company's best interest.

These signs if placed throughout your facility, can educate employees as to where their nearest/safest exit is located and as equally important, where the assembly area is located. This is especially critical for larger companies with numerous employees.

Employees must know where to go in order for management to account for them. What companies are trying to avoid is situations where employees cannot be accounted for and therefore rescuers may risk their lives looking for these individuals. Unfortunately in some of these situations fireman have needlessly lost their lives looking for employees who as it turns out were never in the building to begin with. Therefore, good evacuation procedures, as well as procedures for accounting for all employees is critical.

Having these maps prominently displayed in areas or walls that employees are constantly passing will hopefully ensure that everyone knows what to do, and where to go in the event of an evacuation. To briefly go over these procedures, the following 'action list' should help you inform/educate employees as to what should happen. First of all, if an employee hears the alarm they should do the following.

1. Safely shut down the equipment they are working on.
2. Go to the nearest/safest exit. (Nearest/safest obviously implies that employees should go away from obvious fire and smoke areas.)
3. Once outside proceed immediately to the designated assembly area for headcount.
4. Remain there until the supervisor says otherwise.

This last point is not a suggestion. The law requires that if an evacuation is called for employees must be accounted for and that information given to emergency response authorities. Also, you do not want to lose effective control of employees and have them prematurely reentering the building.

Now, if an employee is authorized to fight certain types (which should only be small paper fires, or fires that can easily be extinguished) they should know the location of the extinguishers (see appendix C on Fire Extinguisher Placement.) Having the location designated on the evacuation 'You are here' maps can help this area.

These signs should also indicate the location of first aid kits, main electrical shut-off switches, main electrical panels, hazardous waste storage areas as well as the location of hazardous chemicals such as solvent etc. These requirements are required in California for businesses that have 'California Business Plan or are subject to them.

We also recommend that if possible make these signs large and easy to read. Having small print etc. can make the sign look 'busy' and hard to read. When making the signs assume that strangers or people unfamiliar with your building can easily read them and exit safely. If strangers etc. can read them then there should be no doubt that employees will be able to read them as well.

It is also a good idea to place emergency phone numbers on these signs as well. Many companies may be too dependent on the '911' system only to find that sometimes they cannot get through. Therefore, you should always have the local police, fire, poison control etc. number posted.

Appendix I Earthquake Evacuation Procedures

The following procedures shall be observed by all employees in situations involving a major earthquake, during which there is an imminent potential for substantial structural damage to the building as well as a direct threat to the safety of building occupants:

During an Earthquake:

1. **Attempt to remain calm and take cover!** Take one of the following actions as you feel appropriate for your situation:
   a. Stand in a strong doorway. Brace your back against the hinge side of the doorway and push against the opposite side of the doorway with both arms. Keep your head down under your arms.
   b. Duck and cover under a sturdy desk or table. Crouch down under a sturdy desk or table. Keep your head down and brace your neck with both hands behind your neck.
   c. Brace yourself or duck and cover against an inside wall. Crouch down while protecting your head, bracing yourself against an inside wall such as would be found in a hallway. Take cover away from windows, storage racks, bookcases, hanging plants, lights, etc. **Caution: Do not run outside or downstairs.** The greatest areas of danger during an earthquake will be just outside doorways and outer building walls. Breaking glass and falling debris will be your biggest threats. Other outdoor hazards will include downed power lines, ruptured natural gas lines with possible explosions, falling light poles, etc. Keep in mind that drop-ceilings will not prevent debris from crashing through, so be especially careful.

2. If you happen to be caught outside when the quake is occurring, duck and cover in a wide-open area well away from power poles, light poles, and anything else that could fall on you.

3. Attempt to shut down or turn off any machines or equipment if time allows.

After an Earthquake:

1. Attempt to remain calm. The most likely threats following an earthquake are both fire and explosion.

2. If it is apparent that significant structural damage has occurred or is likely to have occurred, initiate evacuation procedures as previously mentioned for fire evacuation.

3. Avoid operating any electrical equipment, or energizing any other electrical sources as these sources may initiate an explosion by igniting natural gas vapors, or vapors produced by spilled chemicals. Allow response authorities to first give the all-clear before resuming operations.

Employees, once evacuated, should not under any circumstances re-enter the facility until responsible authorities have given the all-clear. Any clean-up that is to be performed should be done with supervisor's approval.

Appendix J Eyewash Procedures

The issue of ***Eyewashes*** is one of the most often discussed topics. The answers to the basic questions of when, where, how etc. should eye washes be utilized can sometimes be difficult to understand (and explain). The following information is an attempt to cover the subject thoroughly, yet briefly. If questions arise as to your particular application please feel free to call ACS.

First of all, all OSHA standards regardless of the state are based on the federal standard, in this case CFR 1910.151 (c), which states;
(c) Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.
As you can see this is not much to go on. However, OSHA subsequent to this regulation has written interpretation letters in an attempt to clarify some of the issues that have arisen and are common throughout industry. One such letter dated November 29th 1993 defers many of the specifics to the American National Standards Institute (ANSI) Z358.1-1990. As with many OSHA regulations many requirements are incorporated by reference from other private/association type regulations, in this case ANSI.

In this letter the ANSI standards pertaining to eye washes are briefly summarized as follows….
"Plumbed emergency eyewash units must be able to deliver not less that 1.5 liters (.4 gallons) of clean water per minute. The water must be readily available to wash both eyes simultaneously and the flushing streams must rise to approximately equal heights. The emergency eyewash units must be designed to provide flushing water velocities which are not injurious to the eyes. The eyewash area must be spacious enough to allow the eyelids to be held open, with both hands at once, while the eyes are in the water streams. The nozzles must be protected to prevent freezing of the flushing water in cold weather and contact with airborne contaminants. Nozzle covers must not require a separate motion by the operator to be removed when activating the emergency eyewash unit. The flow control valve must be designed so the water flow remains on without requiring the use of the operator's hands. The flow valve must be simple to operate and must go "on" in 1 second or less and must be resistant to corrosion from potable water. The flow valve actuator must be large enough to be easily located and easy to operate"

(NOTE: These and other OSHA interpretative letters can be found on OSHA's web site www.osha.gov)
These same standards also specify that the flow rate mentioned above must be maintained for no less than 15 minutes. Eye wash bottles do not constitute an approved eyewash. These eye wash bottles are referred to as 'Personal Eye washes' and are defined as "a portable, supplementary eyewash that supports plumbed units, self-contained units, or both, by delivering immediate flushing for less than 15 minutes."

In other words you can have these bottles but they can in no way replace plumbed or self-contained eye washes that provide 15 minutes of continuous flow.

The requirement for self-contained or 'gravity-feed' eye washes is for the most part the same for plumbed units. Furthermore, both types should be positioned or mounted 33"- 45" from the floor and positioned at least 6" from wall or nearest obstruction.

The maintenance requirements for a plumbed unit according to ANSI standards are that they should be tested on a weekly basis. Gravity-feed units should be tested according to manufacturer's specification. Also, it should be noted that Gravity-feed or self-contained units are required periodically (according manufacturer's specs.) to be flushed and refilled.
For California, the maintenance requirement is only to be done on a monthly basis. For Washington it only says that they should be checked "periodically" to insure proper functioning. (We recommend as many times as necessary to insure functionality, but no less than monthly.)

Often eyewashes are blocked by things such as pallets, trash cans etc. This obviously is unacceptable; they must be accessible at all times. Also, we have noticed that many times the little caps that cover the nozzles are displaced or altogether missing. Again these nozzles must be covered to prevent contaminants from clogging nozzles as well as maintaining them clean and free from debris.

One of the most difficult issues to resolve concerning eyewashes is the distance from the eye washes to areas where there is a potential for material to get into the eyes. The ANSI standards clearly state that eyewashes should be within 10 seconds or 100 feet from these areas. California and Washington State regulations both require eyewashes to be within 10 seconds. Washington State does require a minimum distance of 50 feet. (Other states follow the federal standards referencing ANSI standards).

When determining placement in your facility remember the 10-second rule applies to an injured person! If someone has contamination in their eyes, they are not going to be able to walk the same distance in 10 seconds as someone who is not. For this reason we strongly recommend that the distance be within 20 feet. In either case the eyewash must be in the same area (room) not in another building, floor etc. Also, someone with an eye injury should not have to go through doors or negotiate several obstacles and aisle ways to reach the eyewash. Many OSHA consultants we have talked to agree with this interpretation.

Make sure employees are aware of the eye wash; it's purpose, how to activate it and the need to flush their injured eyes for at least 15 minutes. The eyewash should be in a prominent area and marked according to ANSI standards (sign indicating eye wash location).

Finally, two related questions invariably come up. The first is "can eye washes be attached to current water faucets? And secondly, if so what about hot water?"

This issue was specifically addressed in an OSHA interpretation letter dated 9/9/92, in reference to brand-name eyewash called 'Opti-Klens'. This eyewash, in order to be activated, must first have the faucet turned on, and then a plunger is either pushed or pulled to activate the 2 nozzles. The question is, does this comply with the one-second rule for activation? OSHA responded in the affirmative, which is yes it can, if it can be done within one second. The 'Opti-Klen device was tested and it was found that the average time was 0.78 seconds. Obviously, these times can vary and it would take a time study to know for sure.

Related to this is the question of whether or not a faucet can be used if it provides hot water? Now, most faucets have either individually activated 'hot' and 'cold' faucets or a faucet activated by one handle in which the temperature depends on which way the handle is pulled.

According to the letter if it is possible for employees to be injured by hot water then these type faucets cannot be used. However, who is to determine if this is possible? Again this is open to interpretation. One must weigh the advantages of a faucet-mounted eye wash (usually the least expensive) versus not having one at all.

One solution may be to lower the temperature on the hot water heater or disconnect the hot water altogether. One-handled activated faucets are the ones most likely to be inadvertently activated so that hot water comes forth rather than cold. We, therefore recommend that companies not use the one-handed activated faucets and take steps to reduce or eliminate the possibility of hot water accidentally being activated rather than cold water.

Again, if you have any questions please ACS!

Appendix K Exit Sign Requirements

Questions often arise concerning "Exit" signs and how and where they should be placed. There are, as one would imagine several regulations concerning the requirements for Exits! For the purpose of this brief, we will limit the discussion to 'Exits' signs themselves. The Federal regulations concerning exits are 1910.35 through 1910.37. (And for California Title 8 3216 to 3229) The wording in the regulations for certain states varies from the Federal standard; however, they basically convey the same information.

First of all, in CFR 1910.36 (b) (5) it says:

> "Every exit shall be clearly visible or the route to reach it shall be conspicuously indicated in such a manner that every occupant of every building or structure who is physically and mentally capable will readily know the direction of escape from any point, and each path of escape, in its entirety, shall be so arranged or marked that the way to a place of safety outside is unmistakable. Any doorway or passageway not constituting an exit, or way to reach an exit, but of such a character as to be subject to being mistaken for an exit, shall be so arranged or marked as to minimize its possible confusion with an exit and the resultant danger of persons endeavoring to escape from fire finding themselves trapped in a dead-end space, such as a cellar or storeroom, from which there is no other way out."

Note: Remember this also means in times of power outages. (See appendix L Emergency Illumination for information concerning *Emergency Lights*.)

Another way to look at your facility in terms of EXIT signs and their requirements is to imagine that you are a stranger to your facility and that an emergency such as a fire has occurred. Now as a stranger unfamiliar with your facility layout, can I (you) logically and easily determine which way to safely exit the building? If for example you have two long hallways and only one leads to the exit, is it clear by the signage as to which one leads to that exit. If not, then signs would have to be placed in such a way to indicate the path. Now, as the regulation stated, if a hallway or door is <u>not</u> an exit but could reasonably be mistaken for one, then the door or hallway must have a sign saying so.

Signs for example on a door, which is <u>not</u> an exit, should state "NOT AN EXIT". Likewise for a hallway that leads to no exit must say something to the effect that "THIS HALLWAY HAS NO EXITS" or "STAIRS LEAD TO BASEMENT…NO EXIT!".

Once you have determined where to locate your signs you must then determine what kind of a sign must be placed. The regulation states, "Every required sign designating an exit or way of exit access shall be so located and of such size, color and design as to be readily visible". (1910.37 (q)(3).

Furthermore, "No decorations, furnishings or equipment which impair visibility of an exit sign shall be permitted, nor shall there be any brightly illuminated sign (for other than exit purposes), display, or object in or near the line of vision to the required exit sign of such a character as to so detract attention from the exit sign that it may not be noticed".

When purchasing or making exit signs ensure that it meets the following criteria. That is the word "EXIT" shall be "… in plainly legible letters not less than 6 inches high, with the principal strokes of the letters not less than three-fourths inch wide". For example the letter "I" in EXIT should be at least 6 inches tall (as are the other letters) and that the width of the letter be at least ¾ inch wide, though the other letters will be wider.

Appendix L Emergency Illumination

Recent power outages, especially the rolling black outs in California have prompted many of our customers to call us concerning the requirements of emergency lighting. Hopefully this information will answer any questions you may have concerning this issue. If not, contact ACS!

There is still much confusion surrounding emergency lighting requirements and OSHA officials in many states do not make things easier to understand by their various interpretations. First of all, the basic thing to understand is that the purpose of emergency lighting is to ensure the safe evacuation of employees during times of emergency or power outage. To ensure that evacuations are safe, the primary means of egress must be properly illuminated.

(***Egress*** is defined as a "continuous and unobstructed way of exit travel from any point in a building or structure to a public way and consists of three separate and distinct parts: the way of exit access, the exit, and the way of exit discharge." This would "comprise the vertical and horizontal ways of travel and shall include intervening room spaces, doorways, hallways, corridors, passageways, balconies...stairs, lobbies..." etc.)

The following are the requirements for emergency lighting in states with federally approved OSHA programs as well as for California.

First of all in CFR 1910.36 (b)(6) it says...

" In every building or structure equipped for artificial illumination, adequate and reliable illumination shall be provided for all exits facilities"

Furthermore in 1910.37 (q)(6) it says...

"Every exit sign shall be suitably illuminated by a reliable light source giving a value of not less than 5 foot-candles on the illuminated surface. Artificial lights giving illumination to exit signs other than the internally illuminated types shall have screens, discs or lenses made of translucent material to show red or other specified designating color on the side of the approach."

In other words, internally illuminated signs must have reliable light sources, especially in situations where power is lost. This is also true for those lights that illuminate signs from a distance. These lights must be bright enough to properly illuminate a sign. (So that you can see the color of the letters etc.)

For California, the regulation addressing emergency lighting is 3215 "Means of Egress" This regulation states the following in section (e) ...

"Whenever the building is occupied, exit paths shall be lighted so that they may be easily recognized and all exit and directional signs shall be clearly visible... Artificial lighting sufficient to enable objects to be seen and egress made under emergency conditions shall be provided when natural light is inadequate."

Now emergency lighting is not to be confused with emergency power. Emergency power implies having a generator, which this regulation does not require! However, battery power for lighting is required when the main power is interrupted in order to illuminate the means of egress.

Now, you may say that your facility has windows (and therefore natural light) and that your company does not operate after dark, therefore, why should you have emergency lighting?

Some OSHA inspectors may be lenient in this case, but, I would not count on it since the regulation clearly states, "In every building or structure equipped for artificial illumination, adequate and reliable illumination shall be provided for all exit facilities..." (CFR 1910.36 (b) (6)). And for the California regulation "Whenever the building is occupied, exit paths shall be lighted ... when natural light is inadequate" (GISO 3215 (e))

Therefore you would have to prove that your facility is adequately illuminated at all times by natural light and that you do not operate during evening hours. Do not forget those isolated rooms you may have that have no natural light. The bottom line is if any of your employees are unable to see to exit a building safely then you must have some emergency lighting. This emergency lighting would not include flashlights! The emergency lighting must a device that is fixed. (Not intended or normally moved)

Be sure that if you have emergency illuminated signs, that the bulbs that are not burned out!

Appendix M Rag Container Requirements

The proper disposal of rags is obviously an important Fire Prevention issue. For that reason the following information is an attempt to briefly review some of the requirements. The OSHA regulation addressing this question is CFR 1910.106 (e) (iii). This regulation simply states that:

> (iii) Wastes and Residues. Combustible waste material and residues in a building or unit operating area shall be kept to a minimum, stored in covered metal receptacles and disposed of daily.

Now, we called OSHA to ask how they would interpret this regulation. We were told that the rag cans near the equipment should be constructed of metal and have a lid. (The self-closing lid is the best practical solution in order to insure that the lid is always closed except when depositing rags.) The lid closing is obviously to prevent sparks or other ignition sources from contacting the solvent-soaked rags, as well as insuring that if a fire starts that it will self-smother. This is especially important if the materials stored are known to spontaneously combust.

Also, that these containers should be emptied daily into another metal container with a lid, preferably a 55 gallon one and placed in a designated area. This designated area should be a place that would limit any fire hazards and be marked accordingly. (These markings could be a sign over the top of the container or area outlined with tape on the floor.) The 55-gallon metal can itself must be marked as a waste container with a flammable warning affixed. It would also be a good idea to put a sign on top of the can stating that the lid should be replaced each time rags are deposited in it.

Now, we know that some of you have plastic rag containers. This is fine if the container is designed to be self-smothering, and that the plastic will not deteriorate due to exposure to chemical in the rags.

Also, we have seen where some companies have containers that are designed to close if the rags catch on fire. These containers have a wire that will melt and cause the lid to fall. Now this does meet fire regulations, however the bad news is that these containers do not meet Air Quality regulations.

As we are sure you all know solvent-soaked rags will emit Volatile Organic Compounds (VOC's). And doing this will violate all air quality rules. It does not matter if your facility is exempt from permitting, you still must not allow VOC's to be emitted by exposing solvent-soaked rags directly to air.

Another issue that arises is whether printers should use disposable wipes instead of rags. Well switching to wipes may solve some problems, they however create others. That is, once a disposable rag is soaked with a hazardous material it now becomes a *hazardous waste*. This being the case you must then do a waste determination to see whether or not these wipes can simply go into the trash. Chance are they will not if they have any EPA *listed material* on them or any EPA defined *Characteristic Hazardous Properties* such as flammability, corrosivity etc.

If they are indeed hazardous, they then must be handled as any other hazardous waste i.e. manifesting etc. Cloth rags that are normally leased to printers then picked up to be laundered do not require manifesting. This is one of the advantages that this loophole offers.

Some large companies that use large amounts of rags have invested in solvent-recovery systems in order to save money. The rags are spun in a machine that removes the solvent to be recycled. This option may be cost-effective for your company if you obviously use a large amount.

Another problem often seen is that pressman like to prop open cans so that they can throw the rags in them without having to get down off the press each time to open the container. Again this is a violation. Pressman would be better off to use several rags first, and then place them in the rag containers. (Which should be emptied daily!) Do not allow too many rags to pile up outside to the rag containers!

Appendix N Portable Heater Safety Considerations

As temperatures drop companies begin to use portable heaters in the production areas as a means of making it more comfortable (therefore more productive) for employees. As one can imagine these devices if not properly used or maintained can be very dangerous. In fact according to the U.S. Consumer Product Safety Commission these types of portable heaters cause over 120,000 residential fires annually (That is 22% of the time, portable heaters are the primary causes of residential fires.) The following information contains some important safety considerations when using these heaters.

When choosing a safe portable heater, remember 'cheaper' is not always better! Be sure that the device has been tested and approved by a legitimate source such as Underwriters Laboratories (UL) etc. If the device was 'Made in China' (mainland) be especially cautious when purchasing them. Many devices produced in Mainland China have been found to be poorly made as well as having false safety labels such as UL Listed etc.

These devices should have a safety switch that will deactivate the heater should it begin to overheat! Next, where you locate the heater is also important. Be sure to place in well-ventilated areas at least 3 feet away from combustible solid materials such as wood, paper etc. Keep at least 25 feet away from larger sources of flammables such as five-gallon containers or larger, flameproof cabinets, flammable-dispensing areas, hazardous waste containers etc.

Also, place or mount the heater on stable surfaces as well as in areas that employees are not likely to walk into them. Do not put in main walkways, corridors or paths that would be taken to evacuate the building in case of emergencies. Keep these heaters, especially electrical ones away from moisture or standing water.

For fuel burning heaters it is imperative to use them in well-ventilated areas, as the danger of producing toxic levels of carbon monoxide fumes is especially likely! If employees seem to all of sudden manifest flu-like symptoms such as headache, dizziness, nausea, etc. then this could be warning signs of carbon monoxide poisoning!

Also, with fuel-type heaters use only those fuels recommended by the manufacturer. If using propane tanks, secure extra tanks to wall or cage! When refueling ensure that the device has cooled down and that pilot lights are extinguished.

For electrical heaters, never use extension cords. Always plug them directly into the wall sockets. If the power cord is damaged in any way repair or discontinue use. Give someone in your facility the specific responsibility to ensure these devices are deactivated/shut off when not in use or when your plant shuts down!

Always thoroughly read the manufacturer's written instructions in the owner's manual!

Appendix O Training Tips

It has been said that good training doesn't just happen, it must be prepared for. The following information though brief, will hopefully give you a better idea as to planning and conducting effective training! These following suggestions are based on our experience conducting training for many of you at your facilities. As usual, consult your actual programs for specific requirements. These suggestions are general in nature and can apply to all training you may find yourself conducting.

First of all, good preparation can save you a lot of time and embarrassment. The following lists the steps to be taken long before training takes place. These are:

1. Thoroughly review all materials! I.e.
    a. take the test
    b. Watch the videos (if any)
    c. Anticipate questions
2. Chose a time and place where distractions are minimized! (off-site is great though rarely feasible)
3. Sometimes training at/during lunch may be a good use of time. But be sure the lunch itself is not overly distracting. (Sometimes free food is a good for improving attendance.)
4. Make a master employee list indicating what, when and if training is required for them.
5. Identify those employees who may have learning disabilities in order not to embarrass them in class. Also, identify those who may not understand English well so that alternate materials (or classes) may be provided.
6. Keep classes as small as possible, as large classes can obviously become unwieldy. (A good rule of thumb is to avoid classes over 25 people)
7. Always have materials ready to go in case of a slow down or work stoppage in order to take advantage of down time!
8. Test your Audio/Visual equipment! Do not wait until the day of training to find out that your VCR needs a cable or something!
9.

The following suggestions are to be done during training though some things will obviously need to be planned for.

1. Use visual aid wherever possible i.e., marker boards, flip charts, as well as videos etc.
2. Always have a sign in sheet for any class or safety briefing.
3. Always be prepared to give real-life examples of what you're instructing on. Examples based on your own or your facility experience is best.
4. Provide refreshments i.e. coffee, soda and water.
5. Be specific about start times, breaks etc. (For example plan breaks for when the lunch wagon arrives)
6. Provide tables or clipboards to write on!
7. Always provide and require the employees to use pens! This is because they will be taking tests and signing certificates, which must be in pen, not pencil.
8. Introduce yourself and give a brief background and importance of the training you are about to conduct
9. Speak Loud!
10. Drink lots of water and avoid eating immediately preceding the class.
11. Make eye contact whenever possible. (This is to gage understanding or lack of interest as the case may be)
12. Allow time for Questions and Answers!
13. After the test always grade right then and there. (Usually it is best to have them trade papers) This way it is done and if they got something wrong they hopefully now know what and why.
14. If someone scores less than 70 % consider retraining him or her.
15. And finally, seek feedback as to how the training went from your employee/students.

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