City of San Angelo
72W College Ave 2nd Floor
San Angelo TX 76902

#187108
CONSTRUCTION
Safety Services Company

Worksite: _____ Instructor: _____ Date/Time: _____

Topic C012: Confined Spaces (A)

Introduction: Confined Spaces tend to compound existing hazards and create dangerous situations, which by their nature would pose no particular problem in an "unconfined" space. The leading cause of fatalities in confined spaces is asphyxiation, however, others are: Toxic or flammable gases; Mechanical hazards; Untrained rescuers; Electrocution.

Identifying Confined Spaces: Most hazardous situations occur because no monitoring devices were used, and the confined space was not properly ventilated. For the purposes of worker safety, a confined space is defined as an area that is large enough and of a shape to permit entry, has limited means of entry or exit, and is not designed or intended for continuous occupancy.

Some examples of Confined Spaces are:

- Manholes
- Cupolas
- Furnaces
- Boilers
- Pipelines
- Pits
- Trenches
- Septic Tanks
- Silos
- Storage Tanks
- Ship Holds

Entry into a Confined Space is not only when a person passes through an opening, but also when any part of a worker, such as a hand or head, passes into the confined space. Limited entry or exit means openings are usually small and may make the space difficult to get work or rescue equipment into, and may make it very difficult to escape in case of an emergency. Most confined spaces are not designed for routine tasks such as maintenance, repair, or cleaning and so these or similar tasks may be difficult or dangerous because of hazards within. Other hazards may also be introduced into the confined space by workers such as fumes from welding or fuel vapors and exhaust fumes from equipment. The greatest hazard of confined spaces is hazardous atmosphere, which is a common characteristic of a confined space and includes oxygen deficiency, flammable gases, and toxic atmospheres.

- An oxygen deficient atmosphere has less than 19.5 percent breathable oxygen and should not be entered without an approved self-contained breathing apparatus (SCBA).
- A flammable atmosphere is comprised of sufficient oxygen and high enough proportions of flammable gas, dust, or vapor that if an ignition source such as heat, flame, or spark is provided, an explosion may occur.
- Toxic atmospheres are the presence within the confined space of any substance which may be hazardous to health when ingested, breathed, or absorbed through the skin. Toxins may be solid, liquid, dust, or vapors.

Since gases or vapors can be either lighter or heavier than air, it is necessary to test all levels of a confined space (top, middle, and bottom) for hazardous atmospheres. This must be done by a trained competent person using calibrated testing equipment. If the tests reveal the presence of either oxygen deficient or flammable atmospheres, the space must be ventilated and re-tested before workers may enter. There are several methods of ventilation which may be used for confined spaces. Fans or blowers can be used depending on the size of the space to be ventilated, the openings available, the gases to be exhausted, and the source of air used to ventilate. For example, flammable vapors must not come into contact with an electrically operated device. Ventilation must continue throughout worker occupancy.

- Toxic atmospheres: may be dealt with by using respiratory equipment and personal protective equipment. The equipment used must provide protection to meet the level of the hazard present, and the worker must be trained in the use of the PPE.
- Mechanical Hazards: present in confined spaces, may be made safe by using proper Lockout/Blockout/Tagout procedures. Mechanical hazards introduced by workers may be handled with the proper training on the hazards of the specific tools, equipment, and material that will be used. Proper spacing of workers in the space is necessary to provide safe clearance for work. When an employee works in a confined space that contains exposed, energized parts, protective shields, protective barriers, or insulating materials must be used to avoid inadvertent contact with these parts. Hinged door panels must be secured to prevent swinging into an employee and causing them to contact exposed energized parts.

Conclusion: NIOSH statistics show that 60 percent of all fatalities in confined spaces happen to the would-be rescuers and 65 percent of all confined space fatalities occur because of hazardous atmospheres in which workers failed to use monitoring devices and proper ventilation. The detection of many gases, toxins, or oxygen deficiency cannot be made with only the use of human senses; therefore, always use test equipment before entering confined spaces. It should also be noted that confined space work frequently requires specific confined space training/certification and any person exposed to such hazards should receive proper training/certification. Follow these requirements for safe confined space operations.

Employee Attendance: (*Names or signatures of personnel who are attending this meeting*)

_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____

These guidelines do not supersede local, state, or federal regulations and must not be construed as a substitute for, or legal interpretation of, any OSHA regulations.