

Manual Section 3	Issue Date 03/16/17	Revision Date 01/01/24	Policy Number LLCP-127
	Ammonia Awareness		

Purpose

This program covers Company policy related to Ammonia hazards in the workplace. The intent of this program is to provide employees with general knowledge and guidelines enabling employees to anticipate, recognize, evaluate, and better participate in controlling their exposure to Ammonia found in certain industrial worksites and processing facilities in which we may work.

Scope

All LLC Companies including, Blanchard Industrial, LLC, GIS Engineering, LLC, Grand Isle Shipyard, Inc., and GWIS, Mack Steel, NuWave, Sun Industries, Valvemax, Discovery Industries, Inc.; hereafter identified as “Company”.

What is Ammonia?

Ammonia is a colorless gas under normal conditions. It can be a liquid under pressure. It has a pungent, suffocating odor. Its chemical formula is NH₃, which means that it consists of one atom of nitrogen and three atoms of hydrogen per molecule. Because the atomic weights of nitrogen and hydrogen are not the same, the weight ratio is 82.5% nitrogen to 17.5% hydrogen. Anhydrous means the ammonia is without water. This distinguishes it from ammonia/water solutions.

Anhydrous

Anhydrous is the Greek word for “without water.” Anhydrous ammonia has a very strong affinity for water. It requires large quantities of water to neutralize its caustic effects on moist areas of the body. When anhydrous ammonia contacts water, it forms ammonium hydroxide. Living tissue is dehydrated quickly and the cells destroyed on contact. Anhydrous ammonia attacks any moist part of the body: eyes, ears, nose, throat, bronchia, lungs, any moist skin. Any tissue containing moisture is chemically burned.

Ammonia exposure can occur from the following:

- Working on or near industrial refrigeration machinery rooms, equipment and/or piping
- Working in petroleum refineries
- Working with or near agricultural fertilizer

Hazard Recognition

It is Company policy to train employees with general knowledge and guidelines enabling them to protect themselves and others from unnecessary Ammonia exposure. All employees assigned to job-sites where exposure to Ammonia may be possible shall participate in the identification, evaluation and control of Ammonia hazards. Employees shall be familiar with the local Emergency Action Plan and specific contingency plans for each facility where exposure may occur. Upon discovery or suspicion of Ammonia being present on a jobsite, Company employees are to stop the work immediately and inform their supervisor.

Exposure

High concentrations of ammonia can cause harm if inhaled or contacts eyes or skin.

- Exposure of the eyes to ammonia may cause burning, tearing, temporary blindness and severe eye damage.
 - Eyes are continually bathed in moisture. Anhydrous ammonia will seek this moisture. The burns will result in damage to the eyes, such as cataracts, glaucoma and possibly some permanent vision loss and disfigurement.
- Exposure of the skin to ammonia may cause severe burns and blistering.
 - Anhydrous ammonia causes freezing and chemical burn wherever skin and clothing are moist. The subzero temperature of escaping anhydrous ammonia freezes clothing to the body. Do not attempt to remove any clothing that is frozen to the skin. It must be thawed loose first or skin tissue may be pulled from the victim.

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- The caustic nature of anhydrous ammonia causes skin and tissue burns similar to burns from heat. Do not apply salves, creams or ointments of any kind to the injury. The caustic burning can be stopped only by dilution with large quantities of water.
- Exposure of the respiratory tract (mouth, nose and throat) to ammonia may cause runny nose, coughing, chest pain, severe breathing difficulties, severe burns and death.
 - At low concentrations, the odor of anhydrous ammonia usually will drive the unprotected worker away from the scene. At a higher level of concentration, the worker may not escape without inhaling a dangerous dose. The entire respiratory system is very moist, so anhydrous ammonia will be attracted naturally to that part of the body. When a concentrated level of anhydrous ammonia is inhaled, it will burn the respiratory system quickly. The victim may hurt too much to breathe. The respiratory system essentially may be paralyzed due to the pain.
 - First-response rescue workers may not be able to treat a serious inhalation exposure. Medical technicians may be able to administer oxygen to aid breathing after their arrival on the scene. Maintaining adequate respiration for the victim until delivery to a medical facility may be difficult.
 - Respiratory protection is extremely important, but also limited in what equipment is available. A two-cartridge respirator is effective only for exposure levels of less than 300 ppm. Canister type respirators may be effective for longer periods at higher concentrations, but without skin protection, walking through an ammonia cloud is generally not advisable. A self-contained breathing apparatus (SCBA), which supplies the air to be breathed, and a sealed, protective hazmat suit are required for working in a cloud of escaping anhydrous ammonia. Anything less will not sufficiently protect a person in this situation.

Exposure Levels and The Human Body.		
Exposure (ppm)	Effect on the Body	Permissible Exposure
50 ppm	Detectable by most people	No injury from prolonged or repeated exposure
134 ppm	Irritation of nose and throat	Eight hours maximum exposure
700 ppm	Coughing, severe eye irritation, may lead to loss of sight	One hour maximum exposure
1,700 ppm	Serious lung damage, death unless treated	No exposure permissible
2,000 ppm	Skin blisters and burns within seconds	No exposure permissible
5,000 ppm	Suffocation within minutes	No exposure permissible

First Aid

Start first aid treatment immediately when someone is exposed to anhydrous ammonia. The chemical burning starts instantly and the injury becomes worse as time passes. Treatment consists of flushing the affected body area(s) with large quantities of water.

PPE

Due to the seriousness of exposure to anhydrous ammonia, personal protective equipment must be well-maintained. This includes unvented goggles; rubber gloves; respirator; heavy-duty, long-sleeved shirt, and long pants.

- Goggles must be unvented to keep the anhydrous ammonia away from the eyes. Only the unvented type of goggles will minimize ammonia exposure to the eyes.
- A respirator equipped with anhydrous ammonia cartridges approved by the National Institute for Occupational Safety and Health (NIOSH) is designed only for low-level exposures not to exceed more than 300 ppm. This type of respirator does not have the capacity to protect a person from high-level exposures.
- Clothing should be heavy duty and of a tightly woven fabric. Light weight, thin fabrics will not slow or prevent anhydrous ammonia from passing through. The clothing should be tightly closed at the cuffs and collar to restrict the entry of anhydrous ammonia.

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During a major release or to work in high concentrations of anhydrous ammonia, a fully encapsulating suit with full face mask and SCBA are required.

Controls

Employees will be provided with and required to use impervious clothing, gloves, face shields and other appropriate protective clothing necessary to prevent any possibility of skin contact with liquid anhydrous ammonia or aqueous solutions of ammonia containing more than 10% by weight of ammonia.

Similar precautions shall be taken to prevent the skin from becoming frozen from contact with vessels containing liquid anhydrous ammonia.

- Employees should be aware of clients' contingency plans and provisions.
- Employees must be informed where ammonia is used in the host facility and aware of additional plant safety rules.

Responsibilities

Management –Management is responsible for the following:

- Ensure that the HSE Management System includes an Ammonia policy and that the policy is reviewed annually and revised as necessary to reflect the most recent exposure monitoring data.
- Ensure that Ammonia Hazard Awareness Training is presented to all employees assigned to at-risk areas.
- Provide leadership and support for employees in communicating their responsibility to stop the work when Ammonia hazards are discovered or suspected.
- Provide resources to address and correct any Ammonia related events that arise.
- Determine when medical surveillance is required.
- Ensure that confirmed employee exposures are adequately documented.

Supervision –Supervision is responsible for the following:

- Understand and enforce the Company Ammonia Policy
- Implement site controls isolating employees from Ammonia hazards when Ammonia is discovered or suspected on a jobsite.
- Immediately inform management of any Ammonia exposures on a jobsite.
- Contact a competent individual when Ammonia is discovered on a jobsite.

Employees –Employees are responsible for the following:

- Upon discovery of Ammonia being present on a jobsite, Company employees are to stop the work and immediately inform their supervisor.
- Protect themselves and others from unnecessary Ammonia exposure by wearing appropriate PPE and following safety rules and guidelines regarding Ammonia hazard protection.
- Immediately report to a supervisor any changes, deficiency or breaches in site controls established to isolate employees from Ammonia hazards on a jobsite.
- Participate in and understand Ammonia Awareness training.
- Participate in JSA and hazard recognition activities. Make every effort to identify Ammonia hazards during daily JSA's.

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Training

Training will be provided on the health hazards and any use/handling requirements for Ammonia at time of initial assignment and annually.