

Guide to Anhydrous Ammonia Safety

Preventing Ammonia Accidents during Transportation and Application

CAUTION

**ANHYDROUS
AMMONIA**

“Handle With Care”

The Spring 2010 anhydrous ammonia season was one of the busiest on record. Thousands of tons of ammonia were safely transferred, transported and applied to the credit of the industry. But in our effort to ensure the safe use of this product, we must all work to reduce the number of accidents with ammonia.

Spring 2010 saw a significant increase in the number of ammonia accidents compared to previous years. This brochure attempts to illustrate the types of accidents that occurred and how they could have been prevented.

The Illinois Department of Agriculture Rules & Regulation for the Handling of Anhydrous Ammonia state: *“Any person required to handle, transfer, transport or otherwise work with ammonia shall be trained to understand the properties of ammonia, to become competent in safe operating practices and to take appropriate actions in the event of a leak or emergency.”*

The Illinois Fertilizer & Chemical Association (IFCA) and the Illinois Department of Agriculture (IDA) offer ammonia training each year on the safe handling of this product. Thousands of agricultural retail employees have participated in this training over the years. We encourage farmers who handle ammonia to also attend these training classes. Classes are offered in the spring and fall of each year prior to ammonia season and the training schedule can be obtained by calling the IFCA at 309.827.2774.

The IFCA and IDA have prepared an ammonia safety training video designed specifically for farmers. You can view the video by going to www.ifca.com or www.agr.state.il.us or by contacting IFCA to obtain a copy on DVD.

The key to ammonia safety is: **Proper Training, Respect for the Product, Wearing Protective Gear and SLOWING DOWN.** Always use safety chains for highway transportation and also when connecting tanks to tool bars. The person in possession of ammonia at the time of a release is responsible for notifying the regulatory agencies. **Failure to properly report a release has resulted in monetary penalties that exceed \$10,000 per incident and farmers are not exempt from the reporting requirements.**

The information in this brochure is provided by The Illinois Fertilizer & Chemical Association in partnership with the Illinois Department of Agriculture and the Illinois Farm Bureau.



Illinois Fertilizer &
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This brochure is an overview of anhydrous ammonia safety. Some of these requirements are complex and cannot be fully outlined in this document. The person in possession of NH₃ at the time of a reportable quantity (RQ) release of at least 18 gallons or 100 pounds must notify all four of the following emergency contacts within 15 minutes of knowledge of the RQ release of 18 gallon or 100 pounds.

- **Local Emergency Responders**
(Fire Department, Police etc...) 911
- **Illinois Emergency Management Agency (IEMA)** 800.782.7860 or 217.782.7860
- **National Response Center (NRC)**
800.424.8802
- **Local Emergency Planning Committee (LEPC)**



Emergency Notification Contact Information

The following is a series of releases that occurred in Illinois during the Spring 2010 Anhydrous Ammonia application season. Listed with the incident are corrections in red to help prevent the incident from happening in the future. Example pictures illustrate accidents if proper safety procedures are not followed.

NH3 Release Scenarios Spring 2010

- Hitch failed due to wear. The nurse tank separated from the transport and rolled over into the ditch. [Brown County](#)
- **Correction:** Routine maintenance and inspection. Replace old worn parts with good working parts. Always attach the safety chains to the towing vehicle. (see [Example 1 & 2](#)) (see [example 16](#) for a poorly maintained hitch)
- When turning while crossing a waterway with tractor, toolbar and nurse tank, the hose pulled the liquid withdraw valve off the nurse tank. [Greene County](#)
- **Correction:** Close the liquid withdraw valve on the nurse tank(s) that is supplying product to the toolbar, bleed down the system, disconnect & secure the hoses from the toolbar to the nurse tank(s) prior to navigating ditches, ravines or waterways. Always attach the safety chain to the towing vehicle. (see [Example 3](#)) (see [example 15](#) for improper use of safety chains)
- Going through a ravine dividing two fields, the applicator hose was not long enough to navigate through the crossing. This caused the liquid withdraw valve to break off. [Calhoun County](#)
- **Correction:** Close the liquid withdraw valve on the nurse tank(s) that is supplying product to the toolbar, bleed down the system, disconnect & secure the hoses from the toolbar to the nurse tank(s) prior to navigating ditches, ravines or waterways. (see [example 3](#) and [15](#))
- 580 gallon anhydrous ammonia release occurred due to attempted theft. [Vermilion County](#)
- **Correction:** Return nurse tanks to the ag retail facility when they are no longer in use. Place locking devices or other means of security on nurse tank(s) when they are not in use. (see [example 12](#)) (see [example 17](#) for proper use of locking devices)
- Hose end valve from the toolbar connected to liquid withdraw valve on the nurse tank disconnected and the excess flow valve failed to work. [Ford County](#)
- **Correction:** Conduct routine inspection and maintenance of equipment. Replace all worn or outdated parts with new parts. In order for proper flow to activate the excess flow valve, the liquid withdraw valve must be fully open. The excess flow valve will not function properly by leaving a liquid withdraw valve partially closed. (see [examples 13, 14 and 18](#) to view poorly maintained equipment)
- While pulling two 1000 gallon nurse tanks, the tanks started weaving back and forth. The hitch on the applicator broke, the quick coupler broke away and the nurse tanks turned over in the road ditch. The vapor valve opened releasing product. [Douglas County](#)
- **Correction:** Only one tank should be pulled behind a tractor and toolbar. In Illinois, it is illegal to exceed a combination of three vehicles. A tractor, toolbar and two nurse tanks pulled in tandem is considered four vehicles. Close the nurse tank liquid withdraw valve, disconnect & secure all transfer hoses prior to transporting a toolbar & tank upon a public roadway. Always securely attach safety chains to the towing vehicle prior to transport. (see [example 8](#) for proper nurse tank transport behind a toolbar) (See [examples 5 & 9](#) for proper working quick coupler)
- While truck was pulling a nurse tank, the tank began to whip back and forth. The driver slowed down but the tank whipped harder and rolled over snapping the end of the tongue on the wagon causing the liquid withdraw valve and vapor valves to break off. [McDonough County](#)
- **Correction:** Slow down. The tire rating on NH3 running gears is 25 mph. Although this is just a recommendation from the manufacturer, some running gears should not be pulled faster than 10 or 15 mph. SMV sign tells other motorists you are a slow moving vehicle. (See [example 10](#) for proper way to tow a NH3 nurse tank) (See [example 6](#) to view poor equipment maintenance)
- During ammonia application, the safety clip in the hitch pin broke causing the hitch pin to come out. The transfer hose from the nurse tank to the toolbar broke free of the coupler causing the bleeder valve to snap off. [Wabash County](#)
- **Correction:** Always attach the safety chains to the towing vehicle. Safety chains are designed as a secondary safety measure in the event the hitch pin breaks or fails to function properly. Routine maintenance and inspection of the quick coupler on the toolbar should be performed prior to any NH3 application. Replace worn or damaged parts with new working parts. Dispose of old parts. (See [examples 13 and 18](#) for improper working quick coupler) (see [example 5 & 9](#) or proper working quick coupler)



EXAMPLE 1



EXAMPLE 7



EXAMPLE 13



EXAMPLE 2



EXAMPLE 8



EXAMPLE 14



EXAMPLE 3



EXAMPLE 9



EXAMPLE 15



EXAMPLE 4



EXAMPLE 10



EXAMPLE 16



EXAMPLE 5



EXAMPLE 11



EXAMPLE 17



EXAMPLE 6



EXAMPLE 12



EXAMPLE 18

Continuing with a series of releases that occurred in Illinois during the Spring 2010 Anhydrous Ammonia application season. Listed with each incident are corrections in red to help prevent the incident from happening in the future. Example pictures illustrate accidents if proper safety procedures are not followed.

- NH3 transfer hose of excess length was coiled up and secured. During NH3 application the hose became unsecured and caught up in the nurse tank running gear resulting in breaking the hose end valve off of the bulkhead on wagon. Excess flow valve failed to work. [Greene County](#)
- **Correction:** Make sure the transfer hose from the nurse tank to the toolbar is the appropriate length. Never use a 30 foot hose to make a 10 foot connection. (see example 3) (see example 15 for improper use of safety chains)
- While entering a field with tractor, toolbar and nurse tank, the tank rolled over. The liquid hose broke off at the liquid withdraw valve. [Jackson County](#)
- **Correction:** Shut the liquid withdraw valve off, bleed down the system and unhook the hose from the toolbar to the liquid withdraw valve on the nurse tank prior to entering the field of application. When entering the field of application from a public roadway, the nurse tank liquid withdraw valve shall be closed & all transfer hoses disconnected and secured. (see example 4)
- Truck transporting a pair of NH3 nurse tanks. Back nurse tank turned over and valve partially opened as a result of the accident. [Hancock County](#)
- **Correction:** Slow down. The tire rating on NH3 running gears is 25 mph. Although this is just a recommendation from the manufacturer, some running gears should not be pulled faster than 10 or 15 mph. SMV signs tell other motorists you are a slow moving vehicle. (see example 7) (see example 10 for proper way to transport NH3 nurse tanks)
- Tractor was pulling a toolbar and nurse tank. The hose from the toolbar to the nurse tank worked loose. [Macoupin County](#)
- **Correction:** Routine daily inspection and maintenance should be performed on NH3 application equipment prior to use during the busy Spring and Fall NH3 application seasons. (see example 14)
- Hose connecting nurse tank to toolbar burst due to rubbing on toolbar. [Cumberland County](#)
- **Correction:** Routine daily inspection and maintenance of transfer hose from the toolbar to the NH3 nurse tank should always be conducted prior to starting application. Replace worn or defective parts with new parts. Dispose of old defective parts. Always secure the transfer hose prior to transporting equipment. (see example 11)
- Hole worn in hose supplying NH3 from the nurse tank to the toolbar. [Scott County](#)
- **Correction:** Routine daily inspection and maintenance of transfer hose from the toolbar to the NH3 nurse tank should always be conducted prior to starting application. Replace worn or defective parts with new parts. Dispose of old defective parts. (see example 3)
- The hitch pin connecting the nurse tank to the toolbar broke. The quick coupler on the toolbar did not function properly resulting in the hose pulling the liquid withdraw valve out of the tank. [Logan County](#)
- **Correction:** Always attach the safety chains to the towing vehicle. Safety chains are designed as a secondary safety measure in the event the hitch pin breaks or fails to function properly. Routine maintenance and inspection of the quick coupler on the toolbar should be performed prior to any NH3 application. Replace worn or damaged parts with new working parts. Dispose of old parts. (See examples 13 and 18 for poorly maintained quick coupler) (see examples 5 & 9 for properly maintained and working quick coupler)
- Two NH3 nurse tanks were being pulled, in tandem in the field of application, behind tractor and toolbar. Due to rain, a ditch had been chiseled in prior to NH3 application. While crossing the ditch, the first tank came out of the ditch at a higher level than the second tank putting stress on the transfer hose causing damage to the hose and the tank valve creating a leak at the liquid withdraw valve on the rearmost tank. [Effingham County](#)
- **Correction:** Close the liquid withdraw valve on the nurse tank(s) that is applying product to the toolbar. Bleed down the system, disconnect & secure the hoses from the toolbar to the nurse tank prior to navigating ditches, ravines or waterways. (see example 14)
- While backing up a tractor, toolbar, and nurse tank, the transfer hose caught on the tractor draw bar causing the hose to pull downward on the liquid withdraw valve pulling the transfer hose from the liquid withdraw valve. The excess flow valve did not work to stop the release. [Carroll County](#)
- **Correction:** Close the liquid withdraw valve on the nurse tank that is applying product to the toolbar. Bleed down the system, disconnect & secure the hoses from the toolbar to the nurse tank prior to entering the field of application. The nurse tank(s) liquid withdraw valve shall be closed & all transfer hoses disconnected & secured until application begins. Always make sure to use the proper length hose. A 30 foot hose should not be used to make a 15 foot connection. (see example 3 and 11)



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