

DEC 11 1995

KRB

Department : Agriculture

STATE OF MINNESOTA
Office Memorandum

Date : December 7, 1995

To : Maryanne Hruby, Director
LCRAR

From : Carol Milligan *CM*
Agriculture Planning Division

Phone : 296-6906

Subject : **Submittal of Statement of Need and Reasonableness**

As required by Minnesota Statutes, sections 14.131 and 14.23, attached is the Statement of Need and Reasonableness for rules governing anhydrous ammonia. The Notice of Intent to Adopt Rules and the rules will be published in the *State Register* on 12/26/95.

Please call me if you have any questions.

Attachment

**STATE OF MINNESOTA
DEPARTMENT OF AGRICULTURE**

In the Matter of the Proposed
Rules of the Department of
Agriculture Governing Anhydrous
Ammonia Fertilizer (Minnesota Rules
parts 1513.0010-1513.1100)

STATEMENT OF NEED
AND
REASONABLENESS

INTRODUCTION

The Minnesota Department of Agriculture (MDA) has had an anhydrous ammonia rule since February 20, 1967 (Minnesota Rules parts 1510.0480-1510.1920). Since there is no federal law or federal regulations for the anhydrous ammonia industry, our original ammonia rule used the American National Standards Institute's (ANSI) K61.1 standard as a guide.

The ANSI K61.1 standard is a published standard for anhydrous ammonia written by the Committee on Safety Requirements for the Storage and Handling of Anhydrous Ammonia. The standard represents the consensus of interested parties concerning minimum safety requirements for the storage, transportation and handling of anhydrous ammonia. It is intended to serve as a guide for regulatory authorities in writing their own regulations as well as to assist designers of ammonia installations and others having an interest in its requirements, such as safety engineers, insurance organizations and transportation carriers. Organizations which were represented on the committee are as follows: American Institute of Chemical Engineers, American Society of Agricultural Engineers, American Water Works Association, Association of American Plant Food Control Officials, Association of Reproduction Materials Manufacturers, Compressed Gas Association, Corrosion Technology, Industrial Safety Equipment Association, National Safety Council, Rubber Manufacturers Association, The Fertilizer Institute, The National Board of Boiler and Pressure Vessel Inspectors, US Coast Guard, and US Dept. of Transportation.

The first edition of the K61.1 Standard was published in 1960 and was based on a standard of the Compressed Gas Association, Inc. (CGA) completed in 1950, and submitted to the then American Standards Association for adoption as an American Standard. The CGA standard was used to assist in developing regulations during the early period of the expanded use of anhydrous ammonia for agricultural purposes. There have been several editions since the first and this rule proposal is based on 1989 edition.

The 1989 edition represents a substantial reorganization and expansion of material contained in prior editions. The proposed rule is based on the 1989 edition and has been drafted with the goal of clarifying and updating the existing rule, which has not been updated since

1967. The proposed rule would improve the safety of ammonia systems by updating them to reflect major changes in the areas of technology and regulatory matters in accordance with this most recent standard.

STATUTORY AUTHORITY

The MDA has statutory authority to regulate anhydrous ammonia fertilizer under Minnesota Statutes, section 18C.121, subdivision 1, which authorizes the MDA to establish rules necessary to implement and enforce Minnesota Statutes Chapter 18C Fertilizers, Soil Amendments, Agricultural Liming Materials and Plant Amendments Law. This section specifically states that "the rules must conform to national standards in a manner that is practicable and consistent with state law."

SMALL BUSINESS CONSIDERATIONS

Minnesota Statutes, section 14.115, requires the MDA to consider the effects of this rule on small businesses.

Many of the businesses in the anhydrous ammonia industry are small businesses. Representatives of this industry have been consulted in developing these proposed rules and their comments have been taken into consideration. The proposed rules were closely examined in order to minimize any negative impact on small businesses.

The MDA has examined methods for reducing the impact of this rule on small business as per Minnesota Statutes, section 14.115, subd.2. (a) through (e) and can not do so because; (a) less stringent compliance; (b) less stringent schedules for compliance and; (c) consolidation or simplification of compliance requirements, would jeopardize the purpose of the rule which is to improve the safety of ammonia systems by updating them to reflect changes in the areas of technology and regulatory matters. (d) Due to the potential danger of ammonia when released a lesser standard is not advisable. (e) Exemption of small business from this rule is not practical since many of the ammonia dealers are small businesses, the same comment as c would apply.

EXPENDITURE OF PUBLIC MONEY

Minnesota Statutes, section 14.11 concerning cost to local public bodies is not applicable since the rule will not require the expenditure of public money by local public bodies.

SECTION BY SECTION ANALYSIS OF NEED AND REASONABLENESS

1513.0010 INTRODUCTION.

This section specifies the scope of regulation for the rule and also identifies specific areas of the ammonia industry which are not regulated by this rule.

1513.0020 INCORPORATION BY REFERENCE.

This lists and organizes many of the various codes and standards which are referenced throughout the rule. It also gives the library location where the reference is available.

1513.0030 DEFINITIONS.

This part is needed to explain the precise meaning of the terms as used in this chapter. The meanings are generally from the various codes and standards which are referenced in the rule.

1513.0040 SAFETY.

No other agricultural is as quick to do bodily harm as anhydrous ammonia. It can do damage to the body in three ways. Since ammonia may be stored at very cold temperatures (about -28F), vapors or liquid touching the body can freeze flesh instantaneously. Secondly, anhydrous ammonia is highly alkaline, so it causes caustic chemical burns on contact. This chemical reaction reaches a third stage when the gas joins with the water in the body to form an alkaline aqua, which will continue to burn.

Due to the serious consequences of coming in contact with ammonia it is necessary to require training for people who store, handle, transfer, transport or otherwise work with ammonia. It is also necessary to require handlers of ammonia to have protective equipment available such as: full face gas masks and ammonia canisters, protective gloves, protective boots, protective jacket and pants, goggles, and clean water. It is reasonable to require the above since an accident with ammonia can be very serious, but with proper training and safety equipment serious injury can be prevented.

BASIC RULES

1513.0100 APPLICABILITY.

This simply states that parts 1513.0100 to 1513.0230 apply to the entire chapter unless otherwise noted.

1513.0110 EQUIPMENT AND SYSTEMS.

It is necessary to allow continued use of containers, systems and components constructed and maintained in accordance with prior editions of the ASME code, ANSI K61.1 standards, Safety Requirements for the Storage and Handling of Anhydrous Ammonia and Ammonia Solutions--Part 1 Anhydrous Ammonia, or The Agricultural Nitrogen Institute, Standard M-1, Standard for Storage and Handling of Agricultural Ammonia, since most of the containers in the state were constructed in accordance with one of these codes. Because we are not aware of any documented problems with equipment and systems which can be attributed to a difference between construction standards of the past and present, it is reasonable to allow continued use of these containers.

1513.0120 NEW CONSTRUCTION, REPAIRS, ALTERATIONS AND ORIGINAL TEST OF CONTAINERS, OTHER THAN REFRIGERATED STORAGE TANKS.

This rule is necessary because when dealing with an extremely hazardous product like ammonia it is imperative that each step of container construction and repair be done in exact accordance with the codes which were written specifically for ammonia. It is reasonable to reference ASME code, since we are incorporating opinions of formidable experts in various fields into this rule.

1513.0130 LOCATION OF CONTAINERS.

Considering ammonia's potential danger it is necessary to require some distance between where the storage container is located and potable water, property lines, public roadways, railroads, dwellings, places of public assembly, and confined resident institutions. It is also necessary to have the storage container accessible to emergency vehicles and to keep the storage area clear of combustible materials and other clutter so that emergency personnel will have an unobstructed path for responding in the event of a release.

The issue of what is an appropriate distance from an ammonia storage container to surrounding populations is an important one. This distance serves as a buffer zone which can provide time and distance, which may be needed, for evacuation of people and also dispersal of ammonia. However, it is also important to remember that greater distances can increase the cost of construction and operation, especially when the facility is not allowed to be built at an existing fertilizer facility.

Our current rule requires 400' from any school, hospital, or other place of public assembly to a storage container. In the proposed rule containers of 100,000 gallons or less must be 400' from the nearest dwelling, place of public assembly, or confined resident institution. Since containers of 100,000 gallons or greater have potential for a larger release, the distance is required be 1000' from the nearest dwelling, place of public assembly, or confined resident institution.

Although it is impossible to anticipate all possible scenarios for ammonia releases, our proposal is reasonable since it is based on the ANSI K61.1 standard and the MDAs experiences. This proposal increases the distances in some cases and clarifies that distances from the storage container are also relative to homes. Additionally, the mechanical safety equipment proposed in this rule are intended to reduce ammonia accidents/releases at the ammonia riser (nurse tank fill station) where the greatest potential for a significant release exists. By increasing the distances from storage containers to the surrounding population and by reducing the potential for ammonia releases we feel this proposal is reasonable.

1513.0140 MARKINGS OF NONREFRIGERATED CONTAINERS AND SYSTEMS OTHER THAN DOT CONTAINERS.

It is necessary that all containers have a legible nameplate permanently attached which verifies that the tank meets the requirements of the ASME code in effect at the time it was manufactured, so that upon inspection it can be verified that the container was manufactured according to code and is acceptable for use with ammonia.. This is currently a DOT requirement in 49 CFR 173.315 sub.m.

If the original nameplate is missing or illegible the rule requires testing of the containers and renameplating. The testing and actual nameplating of containers will be done by organizations which have a "R" stamp certification. The "R" stamp is issued by the National Board of Boiler and Pressure Vessel Inspectors to organizations who are authorized to perform repairs of boilers and pressure vessels

If the container passes the required tests a new nameplate will be attached to the container. The alternative to requiring additional testing by the commissioner is to remove containers from service if the nameplate is missing or is illegible. New nurse tanks can cost approximately \$2500 and there may be as many as 4,000 - 5,000 tanks in the state which have illegible or missing nameplates. Since the cost of doing the tests for acquiring a new nameplate is approximately \$200, it is economically reasonable to have this alternative to condemning tanks.

The Minnesota Department of Labor and Industry is responsible for regulating all pressure vessels, except anhydrous ammonia fertilizer containers. The MDA has worked closely with Labor and Industry, DOT, ammonia tank repair companies, and authorized inspectors from insurance companies in developing this renameplating procedure. The MDA has received input from affected agencies and industry and therefore feels this renameplating process is reasonable.

It is also necessary that each container be fitted with a liquid level gauge so that the maximum level to which the container may be filled can be determined and that all container openings except for pressure relief valves, pressure indicating devices, thermometer wells, or liquid level indicators be marked, stenciled, tagged, or decaled to indicate whether the opening is in contact with liquid or vapor. This is reasonable so that ammonia transfers can be completed safely without making assumptions about whether openings are in contact with liquid or vapor.

1513.0150 CONTAINER APPURTENANCES.

Subpart 1. Approval and Subpart 2. Materials and design.

This is necessary to ensure that the system will be able to contain ammonia without concern of incompatibility between ammonia and the system's materials. It is reasonable to rely on qualified experts in the ammonia

industry to set the standards for ammonia materials, since using lesser standards may result in ammonia releases and potentially serious injuries or death.

Subpart 3. Shut-off valves.

It is necessary to have shut-off valves, on connections to containers, as close to the container as practical so that if a failure in the system occurs the flow of product can be stopped as close to the storage source as possible. This is reasonable, since the further away the shut-off valve is from the tank the more product which can potentially be released in the event of an incident. It is also reasonable to exempt pressure relief devices, thermometer wells, liquid level gauging devices, or connections with No. 54 drill size orifice, since these connections are designed to function without a shut-off valve and having a shut-off valve allows the possibility of having these connections closed and thereby eliminating their intended function.

Subpart 4. Excess flow valves, Subpart 5. Exceptions and Subpart 6. Installation.

It is necessary to install excess flow valves to protect connections and lines to minimize the amount of ammonia released in the event of a system failure. It is reasonable to install the excess flow valve as close as practicable to where the line enters the container and to have the valve function automatically so that the valve is in the best possible position to protect the contents of the container and close without manual involvement, since this may not be possible in the event of a release. It is also reasonable to exempt openings of No. 54 drill size or smaller since the amount of product which could escape through this opening would be minimal.

Subpart 7. By-pass, Subpart 8. Integral excess flow valve and Subpart 9. Markings.

It is necessary to have integral excess flow valves designed so that the valve will close in the event the valve body is sheared or broken off and that the valve be designed with a by-pass. In the event of the valve shearing the valve must close in order to protect the container contents from releasing, and after the valve has closed a by-pass is needed in order for the valve to reset and be ready to function again. It is also necessary that excess flow valves be plainly and permanently marked with name or trademark of the manufacturer, the catalog number, and the rated capacity so it can be verified that the proper valve is in the right place

It's reasonable to have an excess flow which will still close in the event the valve body is sheared or broken and that the valve has a by-pass because the entire contents of the container could be lost without the valve remaining intact. Without a by-pass the valve could not be reset and product in the container would not be accessible. It's also reasonable to have the valve properly marked, since there is no other practical way to determine that information.

Subpart 10. **Positive shut-off valve** and Subpart 11. **Quick opening valves.**

Having a positive shut-off valve and not a quick opening valve is necessary because there must be a completely reliable method to prevent the escape of product from the container. This is reasonable because not having a positive shut-off valve would offer no way to manually stop the flow near the storage source.

1513.0160 PIPING, TUBING, AND FITTINGS and 1513.0170 HOSE SPECIFICATIONS.

All piping, tubing, fittings and hose must be made of suitable material for ammonia service and be installed in accordance with good piping practices. This is necessary to ensure that the system will be able to contain ammonia without concern of incompatibility between ammonia and system materials. Some materials, such as brass, are extremely incompatible with ammonia and corrode quickly. It is also necessary to replace ammonia hose based on manufacturer's recommendations, since they have set the replacement date based on research designed to evaluate the service life of their hose. Prior to the manufacturer's replacement date, given proper care of the hose, the manufacturer is warranting their product to function properly. This is reasonable since system installations not constructed according to nationally recognized standards codes and manufacturer's recommendations could risk the release of ammonia which could result in potentially serious injuries or death.

1513.0180 PRESSURE RELIEF DEVICES

All ammonia systems covered in parts 1513.0300 to 1513.0380 and 1513.1000 to 1513.1070 must have one or more pressure relief valves properly installed, rated, designed, marked and tested. This rule is necessary in order to ensure that the proper pressure relief valves are being used in the intended manner and to be able to verify through markings the manufacturing specifications. It is also necessary to replace pressure relief valves based on manufacturer's recommendations, since they have determined the valve's service life base on research designed to evaluate the safe operating duration of their valve. Prior to the manufacturer's replacement date, given proper care of the valve, the manufacturer is warranting their product to function properly. This is reasonable because the pressure relief devices are the only built in pressure releasing mechanisms that the ammonia systems have. Without properly installed and functioning pressure relieving devices in a system an excess build up of pressure could result in a rupture of the system and an ammonia release.

1513.0190 FILLING DENSITIES.

It is necessary to have a rule which addresses the maximum filling densities for ammonia so that containers are

not filled beyond the intended capacity. It is reasonable to require this since filling container beyond the filling density could result in an ammonia release,. Overfilling can happen even when the container is initially filled to less than 100 percent, since ammonia liquid expands as temperature rises.

1513.0200 TRANSFER OF LIQUIDS

Subpart 1. Construction materials.

It is necessary that ammonia be of a suitable temperature for the material of which the container is constructed, to ensure compatibility between the product and container. This is necessary since improper product temperature can promote cracking in the container. It is reasonable to rely on standards written by qualified experts in the industry, since using lesser standards could result in ammonia releases.

Subpart 2. Operator.

Due to the extremely hazardous characteristics of ammonia it is necessary to have at least one qualified operator present to monitor the transfer of ammonia from the time the transfer connections are first made until they are finally disconnected. It is reasonable to reference CFR 29, parts 1900-1910 in this rule for the MDA's regulation, since it is already required through this Federal regulation.

Subpart 3. Unloading cargo tanks and tank cars.

Ammonia is manufactured precisely to a specific formula, therefore it is necessary not to mix any other gases which might contaminate the product. Contaminates can cause cracking of ammonia containers. It is also necessary to unload ammonia from only permanent storage facilities permitted by the MDA so that we can keep track of all storage facilities in the state. Since contaminated product can cause damage to containers it is reasonable to prevent this and hopefully avert a release. It is also reasonable to know where all storage facilities are so that a proper inspection can be done to assure compliance with the law and that safety issues can be identified and corrected.

Subpart 4. Owner's authorization.

It is necessary that the owner of the container give authorization for filling, since the owner is responsible for knowing whether or not the container is in compliance and in reliable condition to be filled. This is reasonable because a system which is not in the proper condition to accept ammonia presents an unsafe situation.

Subpart 5. Gauging and charging.

It is necessary to charge containers in the open atmosphere so that the ammonia is in an environment in which it can easily disperse. This is reasonable because being in a confined environment with ammonia can be a potential dangerous situation.

Subpart 6. Pumps, Subpart 7. Compressors and Subpart 9. Meters.

It is necessary to use pumps, compressors and meters which are recommended and labeled for ammonia service by the manufacturer, since pumps, compressors or meters which are not specifically made for ammonia can corrode or degrade which may leave them unsafe. This is a reasonable requirement because releases of ammonia can happen when pumps, compressors or meters fail and therefore create a potentially dangerous situation.

Subpart 8. Protection of lines.

It is necessary to require backflow check valves, excess flow valves, automatically operated emergency shut-off valves, weakness or shear fittings or other suitable protection so that in the event of a failure in the ammonia system there is another level of protection which will function automatically. This is reasonable because the greatest potential for an ammonia release is at the transfer points in the system, where these safety features are located. By having these additional safety features installed in the system the chance of having a significant release of ammonia is greatly reduced and potential exposure to the environment and surrounding population can also be reduced.

1513.0210 LIQUID LEVEL GAUGING DEVICES.

It is necessary to require that containers have a liquid level gauging device so that it is possible to determine the liquid level when filling so that overfilling a container can be prevented. This is reasonable since overfilling the container can result in the release of ammonia.

1513.0220 PAINTING OF CONTAINERS.

It is necessary to require uninsulated containers painted white and maintained in good condition, since the paint will help to prevent corrosion and reduce heat absorption. This is reasonable, since either a container which is corroded or is overheated might release in an ammonia release.

1513.0230 ELECTRICAL EQUIPMENT AND WIRING.

It is necessary to regulate the electrical equipment and wiring to ensure no reaction will take place with ammonia or the environment, which may cause an release. It is reasonable to require facilities to conform with the National Electrical Code since it was written by qualified experts in the electrical field.

SYSTEMS USING STATIONARY, PIER-MOUNTED OR SKID-MOUNTED ABOVEGROUND OR UNDERGROUND, NONREFRIGERATED STORAGE

1513.0300 APPLICABILITY.

This part simply identifies which types of containers are impacted by this section of the rule.

1513.0310 DESIGN PRESSURE AND CONSTRUCTION OF CONTAINERS.

It is necessary to require containers to be built to a minimum design pressure of 250 psig or in accordance with the code in part 1513.0110, subpart 2, to ensure they will be able to store ammonia under normal working conditions without failing. It is reasonable to reference ASME codes as the required specifications for building ammonia containers, since they were written by experts in this industry and also because they have long history of successful use.

1513.0320 CONTAINER VALVES, ACCESSORIES, AND DISCHARGE CONNECTIONS.

Subpart 1. Excess flow valves.

It is necessary for all vapor and liquid connections, except pressure relief valves and those exempted in part 1513.0150, subparts 5 and 6, to be equipped with excess flow valves or back-pressure check valves for container filling connections, to minimize the amount of ammonia released in the event of a system failure. This is reasonable since the potential for a significant release, in this area, is very good. With properly sized excess flow valves installed in the right locations the potential for releasing the contents of the container is greatly reduced.

Subpart 2. Pressure gauge.

It is necessary for containers to have graduated pressure gauges so it can be easily determined what the actual working pressure is and therefore excessive container pressures prevented. This is reasonable to monitor, since a container being subjected to pressures exceeding those for which it was designed is unsafe.

Subpart 3. Vapor equalizing connection.

It is necessary that all containers have vapor equalizing connections so that as ammonia transfers are done the system has a mechanism to allow vapor to move to the area of least resistance. This is reasonable, to prevent excessive vapor pressure buildup and thereby reduce the potential for unsafe transfers and container pressures which exceed the maximum allowable working pressure.

1513.0330 PRESSURE RELIEF DEVICES.

Subpart 1. Required valves.

A. It is necessary to be able to change relief valves while the container is pressurized by having them in a manifold, since immediate replacement of defective valves may be required. This is reasonable because a defective valve, which could not be changed immediately, could be a dangerous situation which has the potential for an ammonia release.

B. It is necessary for the discharge from pressure relief valves to be vented away from the container, upward and unobstructed to open air such that persons, property, and the environment will not be harmed. It is also necessary for pressure relief valves to have rain caps that

will allow free discharge of vapor and to have provisions for draining condensate, because vapor pressure could become too great due to a rain cap not allowing vapor to discharge, or condensate can promote corrosion which prevents the valve from functioning properly. These requirements are reasonable in order to keep proper maintenance of the pressure relief valves and prevent the premature deterioration of the valves, which could hinder their intended function and result in an ammonia incident.

C. It is necessary to allow noncorrosive vent pipes from two or more pressure relief devices located on the same unit in order that the industry can have a variety of design options to deal with the need for customizing the different facilities which exist. This is reasonable since the vent pipe modifications do not interfere with pressure relief valves function.

Subpart 2. Rate of discharge.

Reducing the discharge rates of spring-loaded pressure relief valves installed on underground containers by not more than 30 percent of the rate of discharge for aboveground containers is necessary in order to reduce the requirements for underground tanks. This is reasonable because underground containers are completely surrounded by soil, which insulates the product in the container and reduces the potential for pressure buildup and therefore the need for rate of discharge capacity.

Subpart 3. Discharge from underground installations.

It is necessary to vent pressure relief valves from underground containers above the high water level, so that the discharge capacity cannot be hindered by water in the event of a flood. This is reasonable because reducing the discharge capacity of a pressure relief valve could cause the container to become over pressurized and potentially set up a situation for a container rupture.

1513.0340 INSTALLATION OF STORAGE CONTAINERS

Subpart 1. Footings, foundations, and subparts and

Subpart 2. Horizontal aboveground containers.

These provisions are necessary to ensure that the resting place for the container is sound and the variety of weather conditions which are encountered do not jeopardize the container by deteriorating the footings and foundations or the container. This is reasonable since the container rests on these structures and their failure could result in the container moving and thereby possibly releasing product.

Subpart 3. Buried containers.

It is necessary to bury containers in order to sufficiently insulate the container from excessive temperatures and to securely anchor or weight the container if needed to prevent floating, so that movement of the container doesn't occur. It is reasonable to insulate a container to prevent product temperature increases and thereby pressure increases which might precede an ammonia release, and it is also reasonable to secure the container

in areas where flooding is possible so that the container is not moved and system components or container damaged.

Subpart 4. Corrosion resistance.

It necessary for an underground container to be protected against damage when being lowered into place and also be protected against corrosion so that the specification to which the container and piping were constructed remain intact. This is reasonable, since any deterioration of the original construction specifications could be detrimental to the integrity of the container.

Subpart 5. Separation.

It is necessary to have a horizontal distance between storage containers of at least five feet so they are accessible for maintenance and emergency personnel. This is reasonable because in the event of an emergency easy access can be critical to containing an ammonia release.

Subpart 6. Protection against flotation.

It is necessary to have secure anchorage or adequate pier height to protect against flotation wherever high water might occur in order to prevent the container from moving. It is reasonable to do this, since the container being moved during a flood could damage the container or piping of the system and cause an ammonia incident.

1513.0350 REINSTALLATION OF CONTAINERS.

Subpart 1. Testing.

Through testing specified by ASME code it is necessary to document that the structural integrity of the container is sufficient for continued use. This is reasonable, since a container which is not structurally sound would be likely to release ammonia.

Subpart 2. Coating; valves.

It is necessary before a container is reinstalled underground that the corrosion resistant coating be put in good condition, because it is likely this coating could have been damaged during its service time and also at removal. It is also necessary, for a container that is to be aboveground, that pressure relief devices or gauging devices comply with aboveground container requirement, since these requirements are more stringent. These requirements are reasonable in order to prevent excessive corrosion on the container and also to ensure adequate pressure relieving devices, both of which are important in preventing releases.

1513.0360 MARKING CONTAINERS.

It is necessary to mark containers with the words, "ANHYDROUS AMMONIA", "INHALATION HAZARD" and marked with the UN identification for ammonia, 1005, so personnel who work around these containers or emergency responders know what product they are dealing with. This is reasonable because it is consistent with current DOT regulations.

It is also necessary to label each container with the appropriate grade or guaranteed analysis of the contents of the container, so that the consumer knows what they are

purchasing. This is reasonable since industry is required by Minnesota Statutes Chapter 18C Fertilizers, Soil Amendments, Agricultural Liming Materials and Plant Amendments Law, to label the containers with the grade or guaranteed analysis.

1513.0370 PROTECTION OF CONTAINER AND APPURTENANCES.

It is necessary for containers and appurtenances to be located or protected by suitable barriers to avoid damage by vehicles, since these facilities have a fair amount of traffic which could potentially come in contact with the ammonia system. It is also necessary for main container shut-off valves and riser hose end valves to be kept closed and locked when the installation is unattended, because these areas are likely prospects for tampering and vandalism. These are reasonable requirements, because these areas have the potential for major releases of ammonia if damaged, tampered with or vandalized.

1513.0380 IDENTIFICATION.

It is necessary for a sign to be displayed at the storage site which is readily visible to emergency response personnel, stating the name, address, and telephone number of the nearest representative, agent, or owner of the storage system, in order to contact someone quickly at anytime during the day who is familiar with the system. This is reasonable, because it may be very useful to have input from an expert with the facility to help answer questions and provide input.

1513.0400 REFRIGERATED STORAGE.

This simply states that parts 1513.0400 to 1513.0500 apply to systems storing ammonia under refrigerated conditions.

1513.0410 DESIGN OF TANKS.

It is necessary to require specifications regarding pressure, temperature and metals so that containers are fabricated properly for refrigerated ammonia storage. It is reasonable to reference appropriate API and ASME standards and codes for the design of refrigerated storage, since these standards and codes have been written by qualified experts in the ammonia industry, and using lesser standards may result in ammonia releases.

1513.0420 INSTALLATION OF STORAGE TANKS ABOVEGROUND.

Subpart 1. **Foundations**, Subpart 2. **Water protection** and Subpart 3. **Freezing protection**.

It is necessary to protect above ground installations from fire with noncombustible foundations, from high water and freezing and frost heaving of the soil, since all of these could result in damage which could jeopardize the integrity of the tank. It is reasonable to make this

requirement in order to reduce the risk of an ammonia release.

Subpart 4. **Liquid containment system**, Subpart 5. **Drainage**, Subpart 6. **Rain water**, Subpart 7. **Dike capacity**, Subpart 8. **Walls** and Subpart 9. **Grading**.

Subparts 4-9 are necessary in order to provide reliable containment in the event of an ammonia release. It is reasonable to have a sound containment system, since product being release beyond the secondary containment would be much more difficult to recover and also could escape to areas where the potential damage to the environment and human health is much greater.

1513.0430 MARKING REFRIGERATED CONTAINERS.

These nameplate markings are needed so that the actual specification that the tank was manufactured to will remain associated with the appropriate tank. This is reasonable so that upon inspection it can be determined if the tank is being used as it was intended.

It is also necessary for the containers to be marked with the words, "ANHYDROUS AMMONIA", "INHALATION HAZARD" and the UN identification number for ammonia, 1005, so personnel who work around these containers or emergency responders know what product they are dealing with. This is reasonable because it is consistent with current DOT regulations.

1513.0440 TANK VALVES, ACCESSORIES, FILL PIPES, AND DISCHARGE PIPES.

Subpart 1. Shut-off valves.

It is necessary to have shut-off valves on tank connections as close to the tank as practical, so that if a failure in the system occurs the flow of product can be stopped as close to the storage source as possible. This is reasonable, since the further away the shut-off valve is from the tank the more product which can potentially be released in the event of an incident. It is also reasonable to exempt pressure relief devices, plugs, thermometer wells, or connections with No. 54 drill size orifice since these connections are designed to function without a shut-off valve and having a shut-off valve allows the possibility having these connections closed and thereby eliminating their intended function.

Subpart 2. Check valve.

It is necessary to require a check valve on the fill connection and remotely operated shut-off valve on other connections if located below the maximum liquid level, so that in the event of a failure in the system there is another level of protection which can be activated. This is reasonable because the increased potential for releases at these locations. Having an additional safety valve at these points reduces the chance of having a significant ammonia incident.

Subpart 3. Refrigerated containers.

It is necessary to require an approved liquid level gauging device and high liquid level alarm so that it is possible to determine the liquid level when filling so that overfilling a tank can be prevented. This is reasonable since overfilling the tank can result in the release of ammonia.

1513.0450 PRESSURE RELIEF VALVES.

It is necessary to have pressure relief valves which are designed for use with ammonia and installed properly, since these valves are the only built in pressure releasing mechanisms that the tank has. This is reasonable, because without properly installed pressure relieving devices in a system, an excess build up of pressure could result in a rupture of the system and an ammonia release.

1513.0460 PROTECTION OF CONTAINERS AND APPURTENANCES.

Simply states that refrigerated storage containers and appurtenances must also comply with part 1513.0370.

1513.0470 REINSTALLATION OF CONTAINERS.

It is necessary for containers, which must be field constructed, to be constructed according to the ASME code, in order to ensure the construction specifications are compatible with ammonia. It is reasonable to do construction in accordance with ASME code, since this code was written by a variety of experts in different fields, including ammonia, and is widely accepted as the guide for the industry.

1513.0480 REFRIGERATION LOAD AND EQUIPMENT.

It is necessary that refrigeration systems be installed properly with regards to computation of refrigeration load, compressors, compressor drives, automatic control equipment, separators, condensers, receivers and liquid drains, and insulation, since a failure in any one of these components could be detrimental to the cooling capabilities of the system. This is reasonable, because if the system is not cooling properly the temperature of the ammonia could increase and cause an incident due to the vaporization of the product.

1513.0490 SAFETY EQUIPMENT.

Due to the serious consequences of coming in contact with ammonia it is necessary to require protective equipment available such as: self-contained breathing apparatus and encapsulating corrosive chemical suits that are impervious to ammonia. This is reasonable, since an accident with ammonia can be very serious, but with proper safety equipment serious releases and injury may be prevented.

1513.0500 IDENTIFICATION.

It is necessary to display on the premises, readily visible to emergency response personnel, the name, address,

and telephone number of the nearest representative of the storage system, in order to be able to contact someone quickly at anytime during the day who is familiar with the system. This is reasonable, because it may be very useful to have input from expert with the facility to help answer questions and provide input.

RAILROAD TANK CARS

1513.0600 APPLICABILITY

This states that parts 1513.0600 to 1513.0640 apply specifically to systems using DOT single unit pressure tank car tanks mounted on railcar and used for ammonia.

1513.0610 DESIGN AND CONSTRUCTION.

It is necessary for ammonia tank car tanks and tank cars to receive approval from the Association of American Railroads Committee on Tank Cars, since this is the governing body of Railroad Transportation. This is reasonable so it can be verified that equipment handling ammonia on the rail is compatible and reliable for use with ammonia.

1513.0620 PRESSURE RELIEF VALVES.

It is necessary for tank cars to be provided with pressure relief valves, since this is the only built in pressure releasing mechanisms that the tank has. This is reasonable, because without a properly installed pressure relief valve in the tank, excess build up of pressure could result in a rupture of the system and an ammonia release.

1513.0630 MARKING AND PLACARDING.

It is necessary to require tank cars to be marked with "ANHYDROUS AMMONIA", "INHALATION HAZARD", with the UN identification number 1005 and with "RESIDUE" placards, so personnel who work around these containers or emergency responders know what product they are dealing with. This is reasonable because it is consistent with current DOT, CFR 49, regulations.

1513.0640 TANK CAR LOADING AND UNLOADING LOCATIONS AND OPERATIONS.

Subpart 1. Governing law.

It is necessary that ammonia tank cars be loaded and unloaded only at locations that are permitted with the MDA, since the MDA is the governing agency and must approve all anhydrous ammonia facilities. This is reasonable that we permit and inspect all ammonia facilities for compliance considering the potential danger of ammonia.

Subpart 2. Level rail track, Subpart 3. Brakes; blocks., Subpart 4. Caution signs. and Subpart 5. Derail.

These precautions are necessary to alert personnel that ammonia is being transfer and to secure the tank car to avert any mishap. This is reasonable to take these precautions, since the potential of an incident during a

transfer of a large quantity of ammonia is substantial without these precautions.

Subpart 6. Purging of tank car.

It is necessary to purge a tank car, which has carried a commodity other than ammonia completely, before filling it with ammonia, since some materials are not compatible with ammonia. This is reasonable, since two materials that are combined, which are not compatible, may produce a serious reaction which could result in an ammonia release.

Subpart 7. Visual inspection.

It is necessary to do a visual inspection prior to connecting loading lines and before releasing a tank car to the carrier, since a visual inspection can identify obvious defects which could be corrected. This is reasonable, since a visual inspection can quickly and easily be completed, and might avert an incident.

Subpart 8. Leakage.

If a leak occurs during loading, the loading must stop and the leak corrected, this is necessary since a leak can be the first sign of a bigger problem. This is reasonable, since the loading operation is a critical transfer which has the potential for a large release.

Subpart 9. Repairs.

This is necessary because this is a container that is pressurized and it must only be worked on by someone who is qualified and understands the proper procedures to follow, so that the container's integrity is not jeopardized. This is reasonable, because improper repair of a pressure vessel can damage the container and leave it unsuitable for ammonia storage.

Subpart 10. Private track.

It is necessary to unload ammonia tank cars on private track or on a carrier track, so that it will be less likely for rail traffic to interfere with the ammonia unloading process. It is reasonable to reduce any possible way that an ammonia accident could happen, which in this case is reducing potential for a rail accident.

Subpart 11. Securing tank car.

It is necessary after loading or unloading a tank car to close all valves, disconnect transfer lines and secure all appurtenances, so that the tank car will be ready for travel and all equipment will stay in place during transportation. This is reasonable, since loose appurtenances can potentially lead to ammonia releases.

Subpart 12. Emergency and rescue equipment.

Due to the serious consequences of coming in contact with ammonia it is necessary to require handlers of ammonia to have protective equipment available. It is reasonable to require these since an accident with ammonia can be very serious, but with proper training and safety equipment serious injury can be prevented.

**SYSTEMS MOUNTED ON TRUCKS, SEMI-TRAILERS, AND TRAILERS FOR
TRANSPORTATION OF AMMONIA**

1513.0700 APPLICABILITY.

This states that parts 1513.0770 to 1513.0830 apply specifically to systems mounted on trucks, semi-trailers, and trailers (other than those covered under parts 1513.1000 to 1513.1070) used for transportation of ammonia.

1513.0710 DESIGN PRESSURE OF CONTAINERS.

It is necessary to rely on the ASME code with regards to design pressure, construction and labeling of appurtenances, since this code was written by experts in pressure container construction industry, and using lesser standards may result in container failures. This is reasonable, since industry is already required to do this through current DOT regulations.

1513.0720 CONTAINER MOUNTING.

It is necessary for containers to be mounted in a safe manner that will not introduce undue stresses or friction to the container and frame, so damage is not done to the container or the cradle. This is reasonable, since damage to either the container or the cradle could result in an accident.

1513.0730 CONTAINER APPURTENANCES.

Subpart 1. Physical damage protection.

It is necessary for container fittings and appurtenances to be protected against physical damage, this is extremely important with this type of container which is intended to be mobile and therefore has a greater likelihood for contact. This is reasonable, because failure of anyone of these fittings or appurtenances could result in the release of ammonia from the container.

Subpart 2. Container openings, Subpart 3. Discharge openings, and Subpart 4. Exception.

It is necessary to provide some protection for all openings in a container, except openings of No. 54 drill size or smaller, such as excess flow valves, remotely controlled internal shut-off valves and back flow check valves, since these valves can prevent the escape of ammonia if the system fails. This is reasonable, since without these protective valves the entire container of ammonia can be released.

Subpart 5. Vapor equalizing valve.

It is necessary that all containers have vapor equalizing connections so that as ammonia transfers are done the system has a mechanism to allow vapor to move to the area of least resistance. This is reasonable, to prevent excessive vapor pressure buildup and thereby reduce the potential for unsafe transfers and container pressures which exceed the maximum allowable working pressure.

Subpart 6. Liquid level gauge.

It is necessary to require that containers have a liquid level gauging device to determine the liquid level

when filling, so that overfilling a container can be prevented. This is reasonable since overfilling the container could result in an ammonia release.

Subpart 7. Pressure gauge.

It is necessary for containers to have graduated pressure gauges so it can be easily determined what the actual working pressure is and therefore excessive container pressures prevented. This is reasonable to monitor, since a container being subjected to pressures exceeding those for which it was designed is unsafe.

1513.0740 PIPING, TUBING, FITTINGS, AND HOSE.

Subpart 1. Mounting; protection.

It is necessary for containers and appurtenances to be securely mounted and protected against physical damage, since these containers are mobile and therefore have a greater potential for physical contact. This is reasonable, because a collision could result in a significant release of ammonia.

Subpart 2. Truck unloading line.

It necessary for the truck unloading line to have an excess flow valve at the hose connection, so that in the event of a failure in the system there is another level of protection which will function automatically. This is reasonable because the greatest potential for an ammonia release is at the transfer sites. This additional safety feature reduces the chance of having a release of ammonia.

Subpart 3. Liquid propane hose.

It is necessary not to use propane hose for ammonia service, since it is not compatible with ammonia and will deteriorate the hose. This is reasonable, since a hose which is not capable of carrying ammonia under pressure will result in an ammonia release and the potential injury of someone.

1513.0750 PRESSURE RELIEF VALVES.

This is necessary so that the relief valves will function as intended and so they are not exposed to harmful conditions which may cause premature deterioration. This is reasonable, because without properly installed and maintained pressure relief valves in the system, excess build up of pressure could result in the rupture of the system and an ammonia release.

1513.0760 PLACARDING AND MARKING OF CONTAINER.

It is necessary to require containers to be marked with the words, "ANHYDROUS AMMONIA", "INHALATION HAZARD" and placarded with the ammonia UN identification number, 1005, so personnel who work around these containers or emergency responders know what product they are dealing with. This is reasonable because it is consistent with current DOT regulations.

1513.0770 TRANSFER OF LIQUIDS.

Subpart 1. Weighing or gauging contents.

It is necessary to require that containers have a liquid level gauging device or be filled by weight so that it is possible to determine the liquid level, so that overfilling a container can be prevented. This is reasonable, since overfilling the container can result in the release of ammonia.

Subpart 2. Pumps; compressors.

It is necessary to use pumps and compressors which are recommended and labeled for ammonia service by the manufacturer, since pumps and compressors which are not specifically made for ammonia can corrode or degrade which may leave them unsafe. This is reasonable because releases of ammonia can happen when pumps or compressors fail and, therefore create a potentially dangerous situation.

Subpart 3. Permanent storage locations.

It is necessary that ammonia cargo tanks be loaded and unloaded only at locations that are permitted with the MDA, since the MDA is the governing agency and must approve all anhydrous ammonia facilities. This is reasonable that we permit and inspect all ammonia facilities for compliance considering the potential danger of ammonia.

1513.0780 TRAILERS AND SEMI-TRAILERS.

The sheer size of these trailers alone is enough reason to be concerned with one "getting away", but considering that ammonia is involved makes it even more critical that the trailers stay in contact with the towing vehicle. It is reasonable to make these requirements, since the DOT already has these requirements.

1513.0790 ELECTRICAL EQUIPMENT AND LIGHTING.

These lights are necessary so that the operator of the trailer is able to signal the intent of the trailer's direction, braking and also be visible in low light conditions or dark. This is reasonable, since the DOT already requires it.

1513.0800 PROTECTION AGAINST COLLISION.

This is necessary, since this is a mobile container and the likelihood of a collision is therefore greater. This is reasonable because a collision involving a mobile ammonia container can potentially be in the vicinity of people and therefore extremely caution needs to be taken.

1513.0810 BRAKES.

These precautions are necessary to avert any mishap due to movement of the container. This is reasonable to take these precautions, since the potential of an incident during a transfer of a large quantity of ammonia is substantial without these precautions.

1513.0820 PORTABLE TANKS.

The statement of need and reasonableness is in the sections referenced.

1513.0830 SAFETY EQUIPMENT.

The statement of need and reasonableness is in the section referenced.

SYSTEMS USING DOT PORTABLE TANKS AND CYLINDERS

1513.0900 APPLICABILITY.

This states that parts 1513.0900 to 1513.0930 apply specifically to systems using cylinders as defined in part 1513.0030, subpart 13.

1513.0910 CONTAINERS AND CYLINDERS.

This is necessary in order to maintain the integrity of the container and help prevent incidents. This is reasonable, since it is already required by DOT, OSHA or CGA regulations.

1513.0920 CONTAINER AND CYLINDER VALVES AND REGULATION EQUIPMENT.

Subpart 1. Tampering protection.

It is necessary for container and cylinder valves and pressure regulation equipment to be protected against tampering, since either inadvertently or intentionally these appurtenances can be altered. This is reasonable, because altering this safety equipment could result in an ammonia incident.

Subpart 2. Protection during transit and storage and Subpart 3. Not in service.

It is necessary to protect container and cylinder valves so that a upon impact damage will not be transmitted to the valves or other connections. This is necessary given the smaller size of these containers and cylinders and therefore the greater likelihood of them being moved and damaged. This is reasonable to protect the valve area of containers and cylinders, since this area is the most vulnerable and has the greatest potential for damage and an ammonia release.

Subpart 4. Cylinder valve connection standards.

This is necessary to ensure valves are fabricated from materials suitable for ammonia and designed for no less than the maximum working pressure of the system. It is reasonable to rely on recognized standards for ammonia and to not use lesser standard which might result ammonia releases.

1513.0930 PRESSURE RELIEF DEVICES.

It is necessary for pressure relief device equipment to be inspected, repaired or replaced according to DOT regulation in order to ensure these are functioning properly to avoid a release. This is reasonable to require this in our rule, since it is already a requirement by DOT.

**SYSTEMS MOUNTED ON FARM WAGONS AND EQUIPMENT, IMPLEMENTS OF
HUSBANDRY FOR TRANSPORTATION OF AMMONIA**

1513.1000 APPLICABILITY.

This states that parts 1513.1000 to 1513.1070 apply to containers of 3,000 gallons or less and systems mounted on farm wagons.

1513.1010 DESIGN OF CONTAINERS.

The statement of need and reasonableness is in the section referenced.

1513.1020 MOUNTING OF CONTAINERS..

It is necessary for containers to be mounted in a safe manner that will evenly distribute weight over both axles, securely mount the container and eliminate metal-to-metal friction so that damage is not done to the container or the cradle. This is reasonable, since damage to either the container or the cradle could result in an ammonia incident.

1513.1030 CONTAINER APPURTENANCES.

Subpart 1. Maximum liquid level gauge.

This is necessary so that container overfilling can be prevented. This is reasonable since overfilling the container can result in the release of ammonia.

Subpart 2. Pressure gauge.

It is necessary for containers to have graduated pressure gauges so it can be easily determined what the actual working pressure is and therefore excessive container pressures prevented. This is reasonable to monitor, since a container being subjected to pressures exceeding those, for which it was designed, is unsafe.

Subpart 3. Filling connection.

The statement of need and reasonableness is in the section referenced.

Subpart 4. Vapor equalization valve.

It is necessary that all containers have vapor equalizing connections so that as ammonia transfers are done the system has a mechanism to allow vapor to move to the area of least resistance. This is reasonable to prevent excessive vapor pressure buildup and thereby reduce the potential for unsafe transfers and container pressures which exceed the maximum allowable working pressure.

Subpart 5. Excess flow valves.

It is necessary for all vapor and liquid connections to be equipped with excess flow connections, so as to minimize the amount of ammonia released in the event of a system failure. This is reasonable since the potential for a significant release is very good. With properly sized excess flow valves installed in the right locations the potential for releasing the contents of the container are greatly reduced.

Subpart 6. Rigid guard.

This is necessary because these containers are mobile and therefore the likelihood of an accident including a rollover is greater. It is reasonable to require this, since in the event of a rollover the appurtenances could very easily be broken off and the contents of the container released, but the rigid guard is designed to prevent the breaking off of appurtenances.

Subpart 7. Coupling device and Subpart 8. Control valve.

It is necessary for an automatic break-a-way, self closing coupling device to be used between the applicator or nurse tank and the metering device, since it is not uncommon for the nurse tank and tool bar to come apart. This is reasonable, since the coupling device is designed to allow the nurse tank and tool bar to separate without damage to the system and without loss of product.

Subpart 9. Liquid withdrawal line.

This is necessary, since mobile containers with connections hanging lower than the wagon axle would have a high probability of doing damage to the connections. This is reasonable, because doing damage to this lower connection could result in a release of ammonia.

Subpart 10. Hose ends.

It is necessary to make provisions for securing both ends of the hose in transit, to prevent damage to the hose and valves. This is reasonable, because damaged hoses and connections are potentially unsafe.

Subpart. 11.

It is necessary to ensure that a container is built to the proper specifications and maintained, so that the risk of an ammonia release is reduced. This is reasonable because it is consistent with current DOT requirements.

1513.1040 PLACARDING AND MARKING OF CONTAINERS.

This is necessary so personnel who work around these containers or emergency responders know what product they are dealing with and a slow moving vehicle emblem can alert other motorists of the slow speed of the wagon on the road. This is reasonable because it is consistent and required already by DOT regulations.

1513.1050 FARM WAGONS AND EQUIPMENT.

This is necessary due to the damage that a container could do if it becomes unhooked from the drawbar. It is reasonable to have safety chains as a backup system to the drawbar and hitch pin, because of the size and weight of the container, and also the contents of the container.

1513.1060 SAFETY EQUIPMENT.

This is necessary to have information readily available at the ammonia handling location so that transfers can be performed safely. This is reasonable, because without the proper information serious ammonia accidents can be the result.

1513.1070 CHEMICAL ADDITIVE COMPATIBILITY.

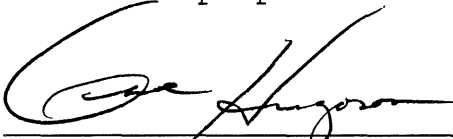
It is necessary to verify the compatibility with system components prior to the addition of a chemical additive, in order to ensure there will be no adverse reaction which could damage the system. This is reasonable, since an incompatibility could deteriorate the container and cause an ammonia release.

**MINIMUM REQUIRED FLOW RATE OF PRESSURE RELIEF DEVICES
1513.1100 MINIMUM FLOW RATES.**

This is necessary in order to easily determine the proper flow rate need to protect a given surface area of container. This is reasonable, since pressure relief valves with too small of a flow rate could potentially be the cause of a container rupture, if pressure was needed to be released from a container and the relief device was inadequate.

1513.1200 REPEALER

This old ammonia rule is being repealed in its entirety. This is necessary since the new rule addresses all the areas which were still pertinent in the old rule. It is unreasonable to retain the old rules when new rules have been proposed.



Gene Hugoson,
Commissioner of Agriculture

12/7/95
Date