Welcome to EPA Region 8's training on Risk Management Program Compliance for Agricultural Ammonia. This training was designed to require approximately one hour.

To control your progress through the training presentation, use the control buttons just below the slide window. (Note that, for the most part, the presentation will auto-advance from one slide to another—except, for instance, when there is a link on the slide or for sections with a knowledge review.)

You can also use the linked navigation panel to the left to move to a particular slide.

A few other features of the interface frame are worth mentioning:

• The blue-gray bar just below the slide window keeps you informed of where you are in the presentation. There's also a volume control button just to the left of this.

• Next, in the upper portion of the left-hand navigation panel, the tab set allows you to switch from the outline listing of slides to a thumbnail view of the slides or to a view with a transcription of the slide voiceovers. The last tab accesses a feature for searching the entire presentation by key words.

• Finally, in the right-hand side of the bar across the top are two navigation items: Behind the "Links/Accessibility" item is an accessible version of the presentation; and the "Bookmark" item allows you to set which slide you want to return to after exiting the presentation before completing it. To exit the presentation window, use your browser close/exit controls.

OK. Let's begin.

Objective

- Provide agricultural ammonia suppliers with guidance and best practices to comply with EPA Risk Management Program (RMP) regulations

This training presentation is being provided to train and inform agricultural ammonia suppliers on EPA's Risk Management Program or RMP requirements. The presentation material is intended to provide guidance and best practice information to support agricultural ammonia suppliers in complying with these requirements.

Agenda

- Section 1: RMP Background
- Section 2: Applicability
- Section 3: Overview of RMP Elements
- Section 4: RMP Best Practices
- Section 5: Case Studies
- Section 6: Preparing for an EPA RMP Inspection
- Section 7: Other Industry Standards
- Section 8: Additional Help

This presentation will cover the following topics:

First some general background on the Risk Management Program and why agricultural ammonia suppliers have been identified and targeted for support;

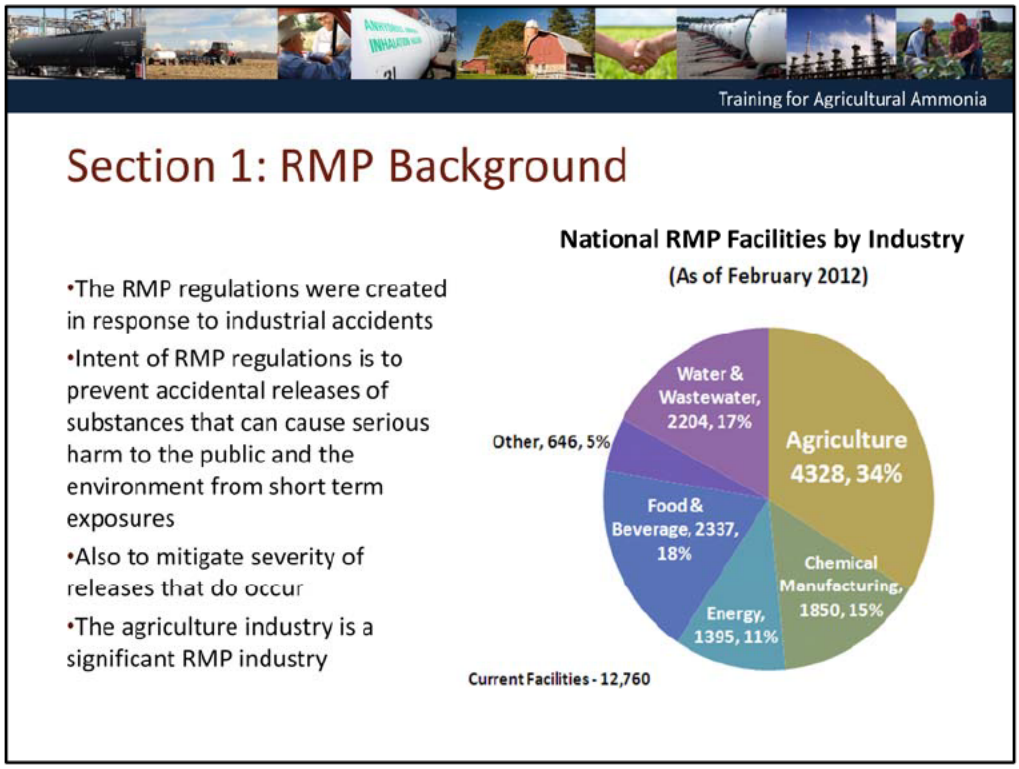
Next, we will provide some guidance and present a decision chart to help you determine whether the RMP requirements for agricultural ammonia apply to you;

Once you have determined that the RMP requirements apply, we present information on applicable elements of the program, including information on tools available to support compliance with these elements.

This training will also provide information on best practices and case studies which discuss and detail issues of specific concern related to RMP compliance.

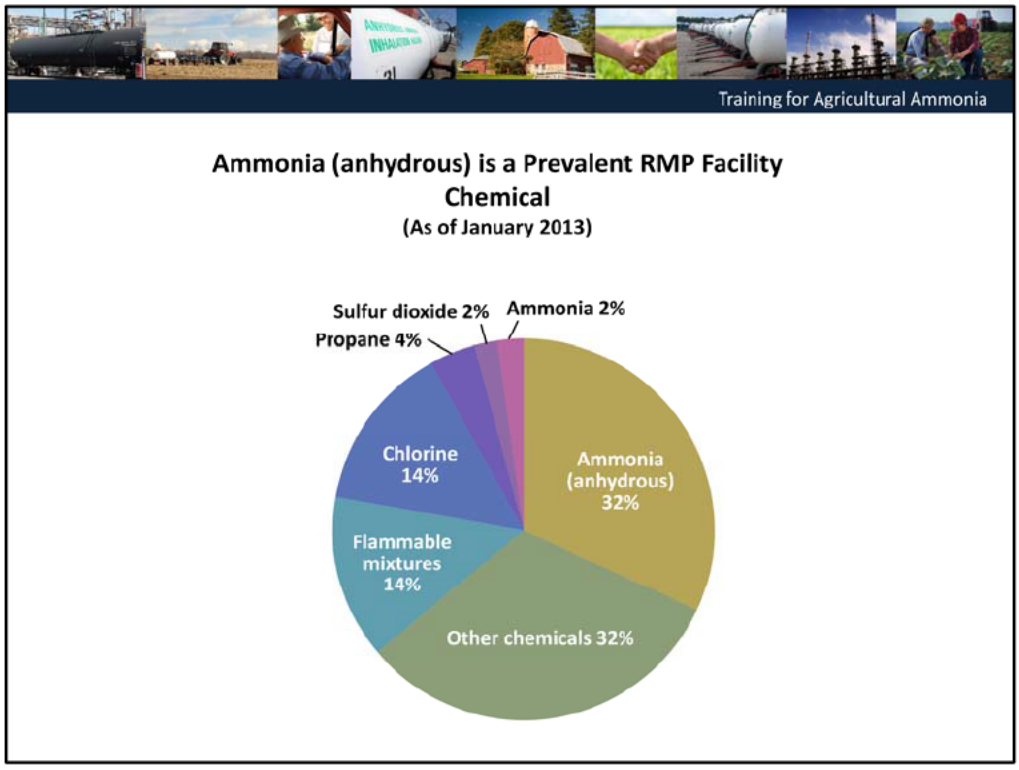
At the end of this presentation we will review helpful hints for preparing for an RMP inspection, information on other National standards that apply to the management of agricultural ammonia, and will finish with information on other sources to access for help.

You will notice that at the completion of Sections 2, 3, and 4, EPA presents some knowledge review questions that you can go over to help ensure that you are understanding and are comfortable with the training material presented.

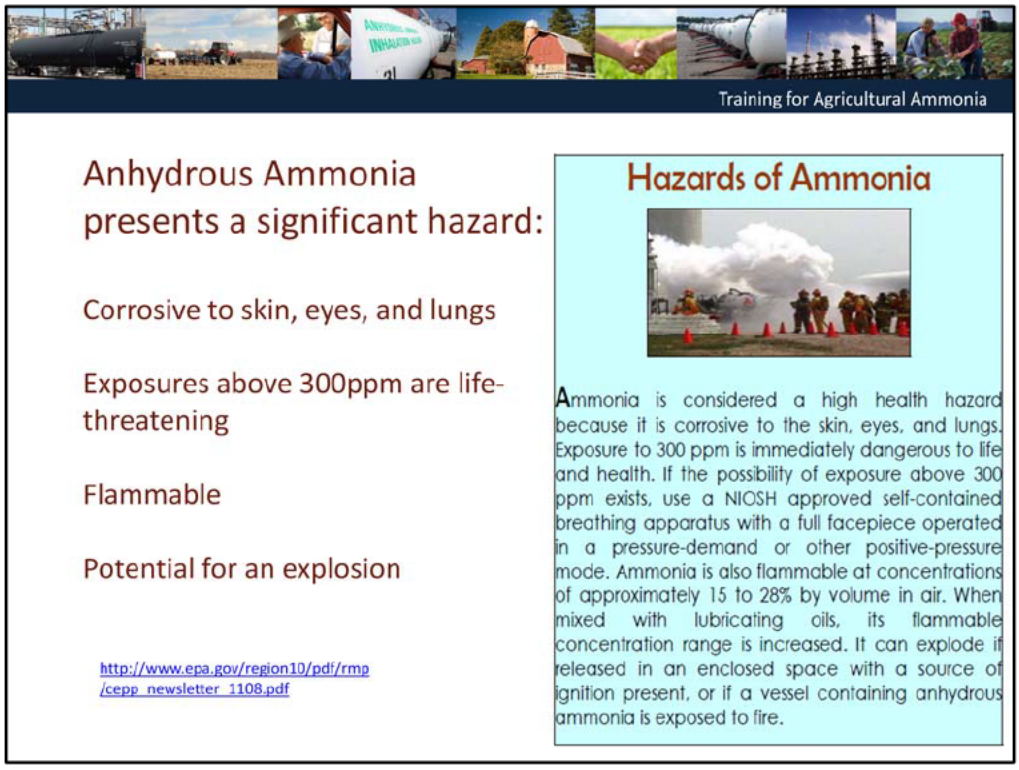


The RMP regulations were specifically developed in response to industrial accidents that were resulting in harm to the public and the environment. The regulations have been designed to minimize and prevent future accidental releases of harmful substances and as we go through this training, we will point out many of the regulatory requirements that are geared to the prevention of future releases.

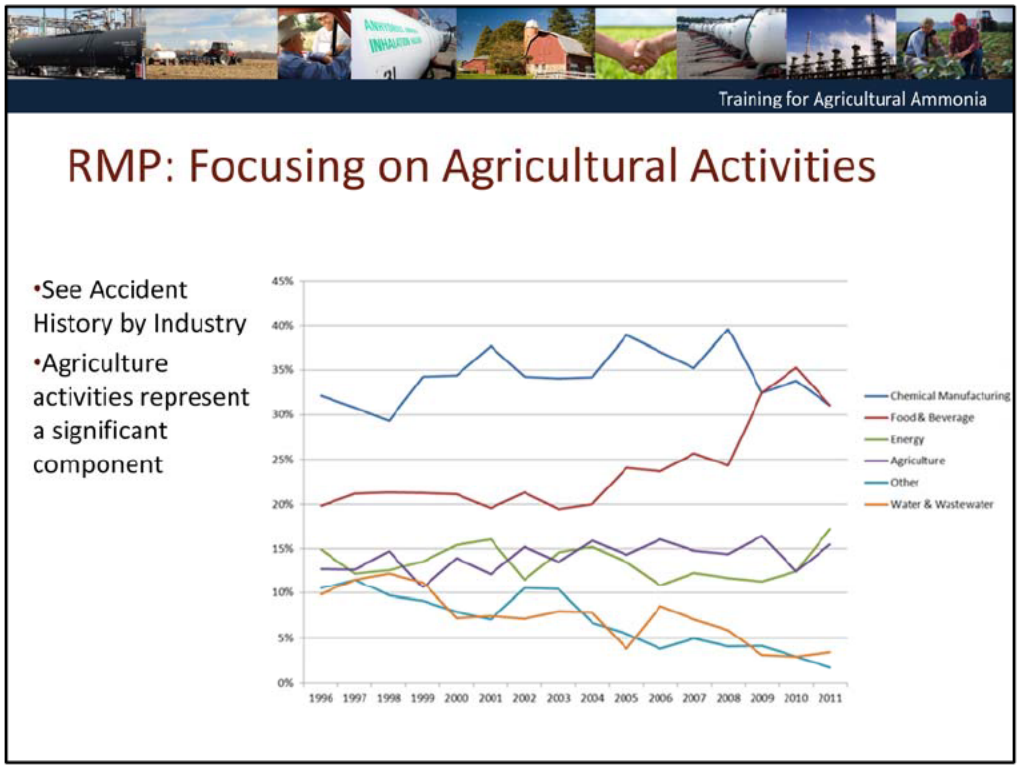
So why is this training focusing on agricultural ammonia suppliers? First, as seen in the pie chart of industries that make up the RMP universe, the agricultural industry represents about 34 percent of all RMP industrial facilities.



The agricultural industry uses RMP chemicals, specifically ammonia, and as seen in the pie chart of prevalent RMP chemicals, anhydrous ammonia represents thirty two percent of the RMP chemical use nationally. Because anhydrous ammonia is a significant component of the RMP universe, understanding and complying with the RMP requirements by the agricultural ammonia industry becomes vital.



The unintended release of anhydrous ammonia presents significant risks. These risks include impacts to the public from skin and breathing exposures since this chemical is corrosive to your skin, eyes, and lungs. Additionally, exposures above 300 parts per million can result in imminent danger to life and health. Other hazards include flammability, since ammonia is flammable at concentrations of approximately 15-28 percent by volume in air and if it is mixed with lubricating oils it becomes even more dangerous. Other concerns include the potential for an ammonia explosion if it should be released in a confined space and exposed to an ignition source or if ammonia in a tank is exposed to fire.



As seen in this accident history chart by industry, agricultural industry accidents reported nationally represent about 15 percent of all accidents. All of these factors combine to focus concern on agricultural ammonia and justify its inclusion in the Risk Management Program. Industry compliance with the RMP regulations is needed to respond to the accidents that have occurred in this industry and to focus on the prevention of accidental releases of ammonia by the agricultural industry in the future.

Training for Agricultural Ammonia

Background on Common Causes of Anhydrous Ammonia Accidents

All of these situations can result in injury, extensive property damage or both.

- Pull away accidents (such as moving the applicator tank before filling hoses have been disconnected)
- Filling tanks beyond recommended capacity.
- Knocking open the hose-end valve accidentally.
- Venting pressure relief valve while a person is in line of discharge.
- Breaking of transfer hose, especially an old or misused one.
- Failing to bleed hose coupling before disconnecting.
- Rupturing of low pressure hose due to pressure buildup when knives plug.
- Releasing ammonia when knives are unplugged.
- Overturning an applicator or nurse tank while in transit or in the field.
- Corrosion from underground piping.
- Theft resulting in an accident (vandalism)

http://www.mda.state.mn.us/chemicals/fertilizers/nh3.aspx
http://www.extension.umn.edu/distribution/cropsystems/dc2326.html

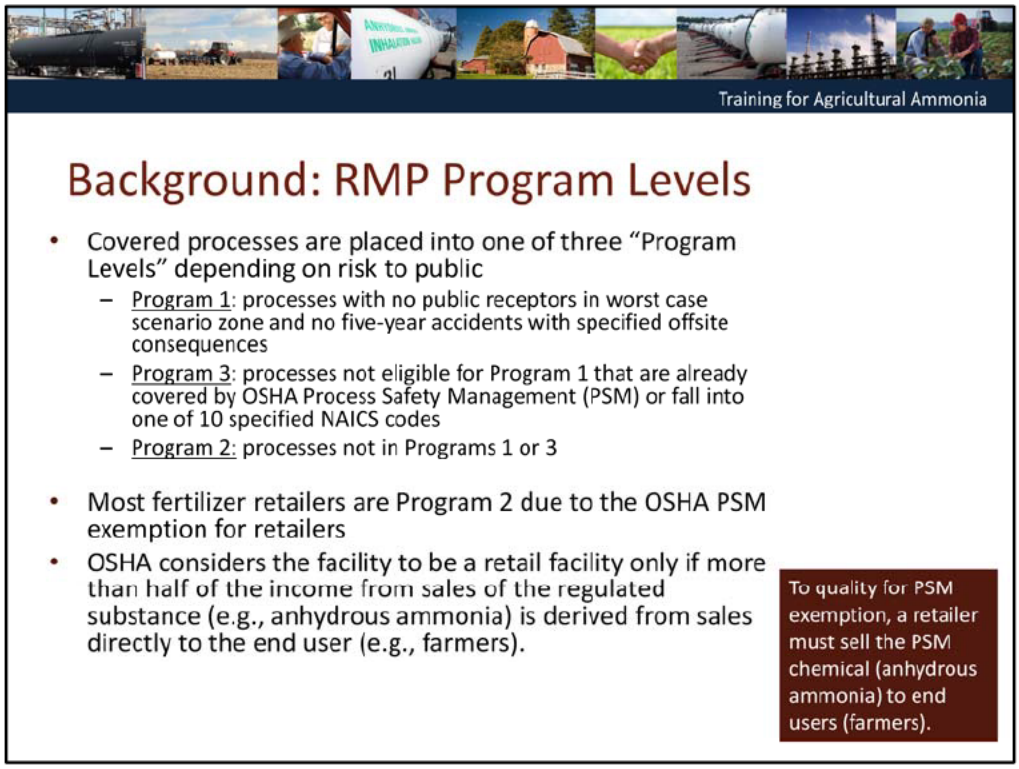
There are a number of common causes of accidental anhydrous ammonia releases in the agricultural industry. These include accidents that occur during tank filling and unloading operations such as pull away accidents, overfilling or hose connection issues or accidents that occur due to the movement of portable storage tanks. Regional inspectors also commonly see failures in old equipment, such as old hoses and old pressure relief valves. In all of these cases, significant human exposure or property damage may occur.

Background on the Regulatory Authority

Anhydrous ammonia is the most prevalent RMP facility chemical (33% of the RMP universe)

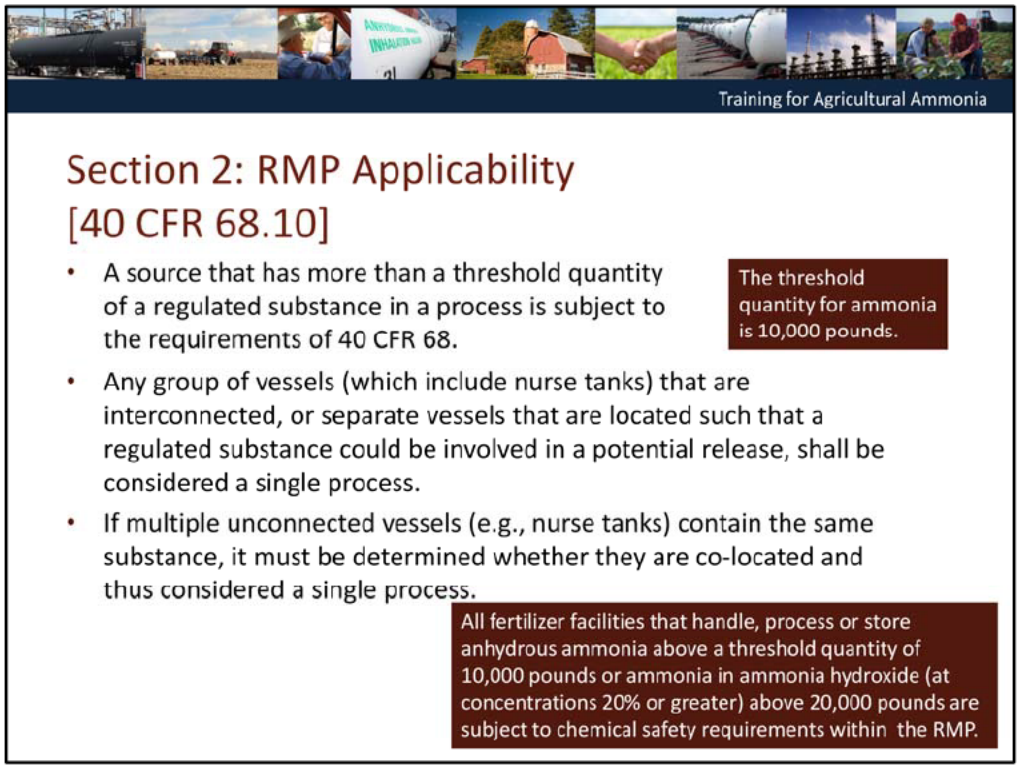
- The RMP program is authorized by section 112(r) of the Clean Air Act.
- The Chemical Accident Prevention Provisions (40 CFR 68) require facilities that produce, handle, process, distribute, or store certain chemicals to develop and implement a RMP, prepare a Risk Management Plan, and submit the Plan to EPA.

EPA's authorization for creation and implementation of the Risk Management Program stems from the authority of the Clean Air Act, Section 112(r). 40 CFR Part 68 of EPA's Code of Federal Regulations outlines the Law's provisions. These provisions require facilities that produce, handle, process, distribute, or store RMP chemicals to develop and implement an RMP program, prepare a Risk Management Plan, and submit this plan to EPA.



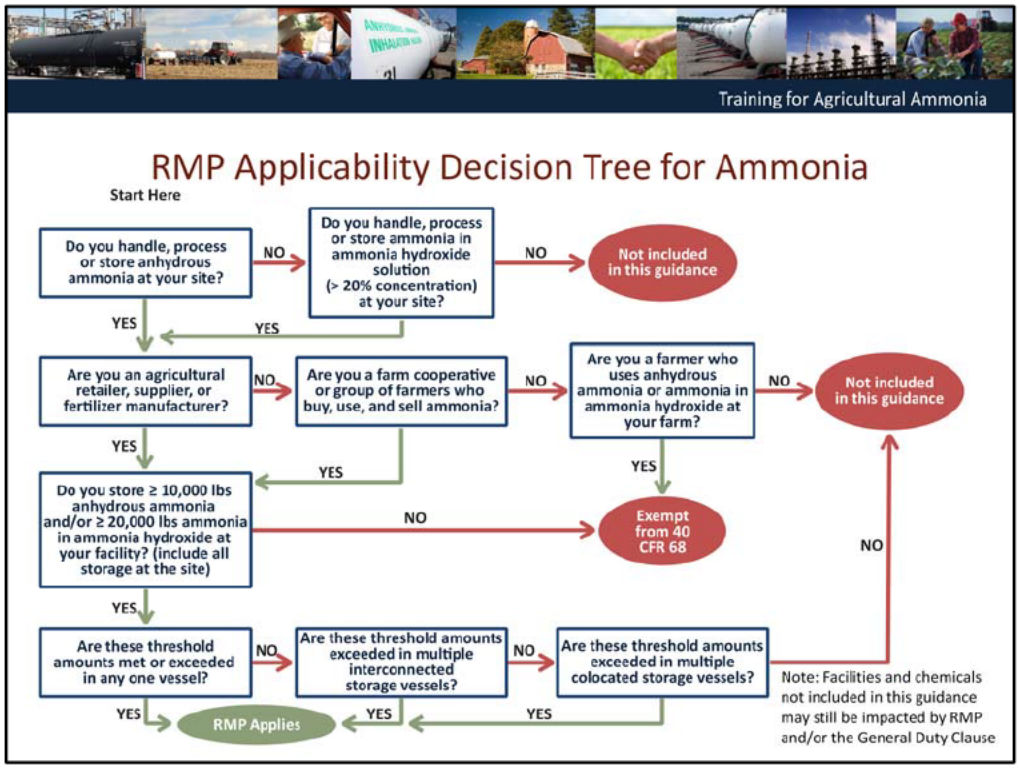
Processes covered by the RMP regulations are characterized into three program levels. Program level 1 encompasses processes that would not impact the public when evaluated in the worst case scenario and that have not had a history of accidents in the past five years with specified offsite consequences. Jumping to Program level 3, this level encompasses processes not eligible under Program level 1 and that are covered by OSHA's Process Safety Management or PSM requirements or those processes that fall into one of ten specified NAICS codes. Program level 2 includes processes that are not covered by Program levels 1 and 3 and for our purposes includes most agricultural ammonia suppliers since they qualify for an exception from OSHA's PSM requirements. This exemption applies to retailers that sell anhydrous ammonia to an end user such as a farmer.

Some agricultural facilities may have a retail ammonia distribution process that qualifies for RMP Program 2 and also have other processes on site that are subject to RMP Program 3. This could happen if the source has a fertilizer production process on site, such as a T-reactor. Program 3 processes must meet more stringent accident prevention program requirements than Program 2 processes. Visit EPA's RMP website or consult with your EPA Regional Office if you need more information on RMP Program 3.



Next let's talk about whether the RMP requirements apply to you. The primary criteria for applicability to the 40 CFR Part 68 RMP requirements is based on the amount of anhydrous ammonia or ammonia in ammonia hydroxide (at a concentration greater than 20%) stored on-site and the logistics of how it is stored and what that could mean in the case of an accidental release. The RMP requirements apply to agricultural ammonia suppliers if they store more than the threshold amount of 10,000 pounds of anhydrous ammonia or 20,000 pounds of ammonia as ammonia hydroxide in a single process. In this case a single process could be a single storage tank that stores greater than 10,000 pounds of anhydrous ammonia or 20,000 pounds of ammonia in ammonia hydroxide or it could be a combination of storage that totals more than these threshold amounts. Where there are multiple storage units, they are considered to be part of a single process when they are interconnected, even if the interconnection is only periodic. Also, multiple storage units would be considered part of a single process if the separate storage units are co-located and could potentially impact each other during a release situation.

Interconnected or unconnected storage included in this applicability determination may include storage tanks, nurse tanks, cylinders and barrels, multiple containers that are in the same building, or multiple containers that are separated but a spill or fire in one could reach and impact the other.



The following decision tree helps identify the key questions to ask yourself to determine whether the RMP requirements are applicable to your facility. Even if they are not, please keep in mind that if you handle an RMP chemical, you may still be covered by the General Duty clause of the Clean Air Act Section 112(r).

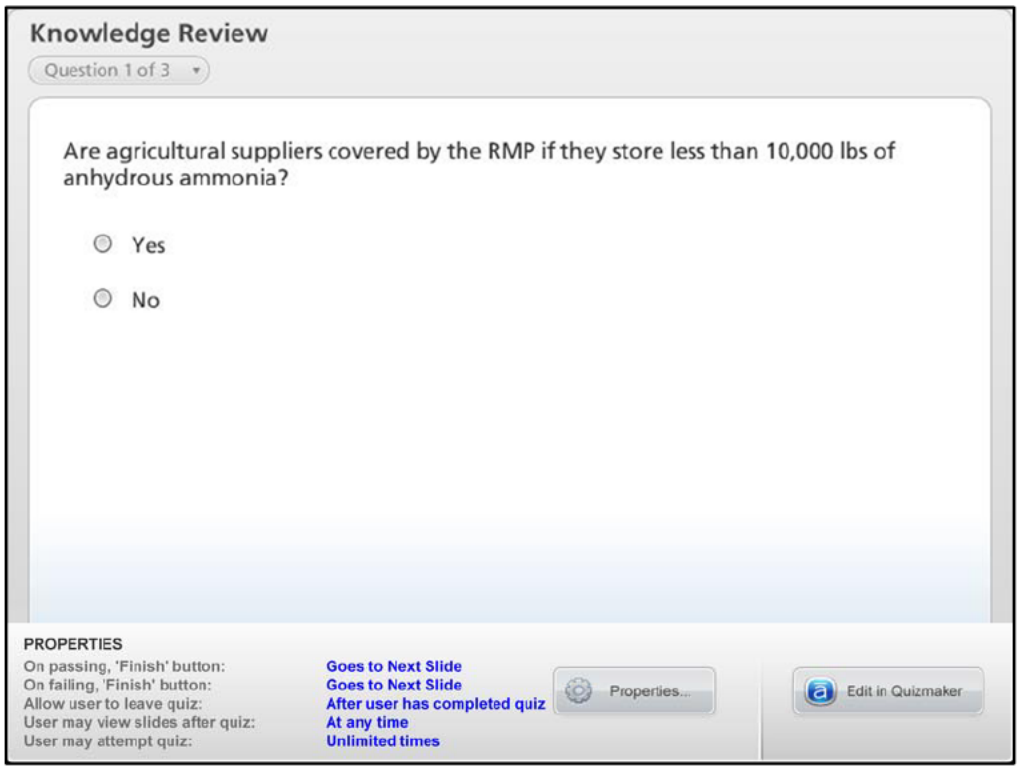
As an example, suppose you handle and store anhydrous ammonia at your facility. If you are an agricultural retailer, supplier, fertilizer manufacturer, or farm cooperative then you need to evaluate whether you store greater than the threshold amount of anhydrous ammonia at your site. If you do, then the RMP requirements would apply if that storage exceeds the threshold from a single process.

RMP Exemptions

- Ammonia is exempt when held by a farmer for use as an agricultural nutrient on a farm.
- This exemption does not apply to:
  - agricultural suppliers,
  - fertilizer manufacturers,
  - the use of ammonia as a refrigerant,
  - farm cooperatives, or
  - to groups of farmers who buy, use, and sell ammonia.
- Reducing the quantity of ammonia at the facility to less than 10,000 lbs can reduce regulatory requirements

Exempt facilities and facilities with less than 10,000 lbs are still subject to General Duty Clause Requirements.

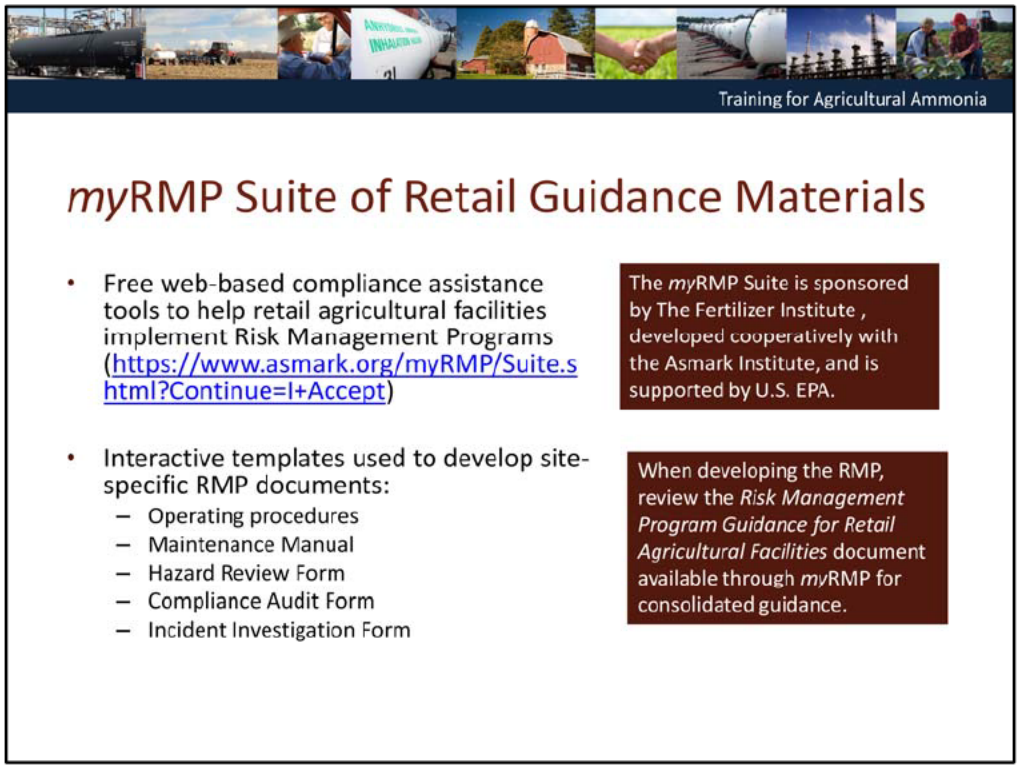
If you are a farmer and use anhydrous ammonia or ammonia in ammonia hydroxide on your farm (but are not an agricultural supplier to others) you are exempt from the RMP requirements of 40 CFR Part 68. This exemption, however, does not apply if you are covered as an agricultural retailer or supplier, are a fertilizer manufacturer, or are part of a group of farmers or farm coop that buys and sells ammonia. If you modify your operation to consistently store less than the threshold amounts of anhydrous ammonia or ammonia in ammonia hydroxide then you can reduce your regulatory requirements under the RMP. However, if your storage of these chemicals is likely to exceed the threshold then RMP requirements will apply.


Knowledge Review
Question 1 of 3
Are agricultural suppliers covered by the RMP if they store less than 10,000 lbs of anhydrous ammonia?
Yes
No
PROPERTIES
On passing, 'Finish' button: Goes to Next Slide
On failing, 'Finish' button: Goes to Next Slide
Allow user to leave quiz: After user has completed quiz
User may view slides after quiz: At any time
User may attempt quiz: Unlimited times
Properties...
Edit in Quizmaker

Section 3: Overview of RMP Elements

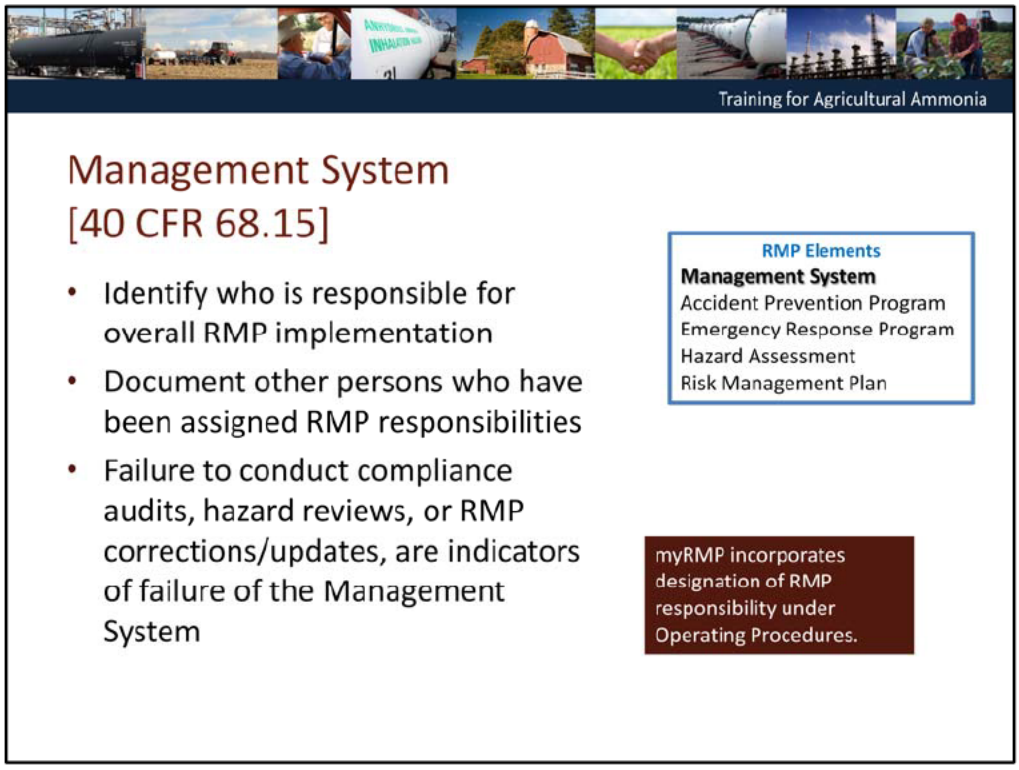
- RMP Requires facilities to:
  - Implement a Management System
  - Implement an Accident Prevention Program
  - Implement an Emergency Response Program
  - Conduct a Hazard Assessment
  - Submit a Risk Management Plan to EPA

In this next section we will be providing you with an overview of the elements that make up the Risk Management Program requirements for agricultural ammonia. The main elements include: implementation of a management system for your RMP chemicals, implementation of an accident prevention program, implementation of an emergency response program, requirements to conduct a hazard assessment, and development of a Risk Management Plan for your facility that must be submitted to EPA.



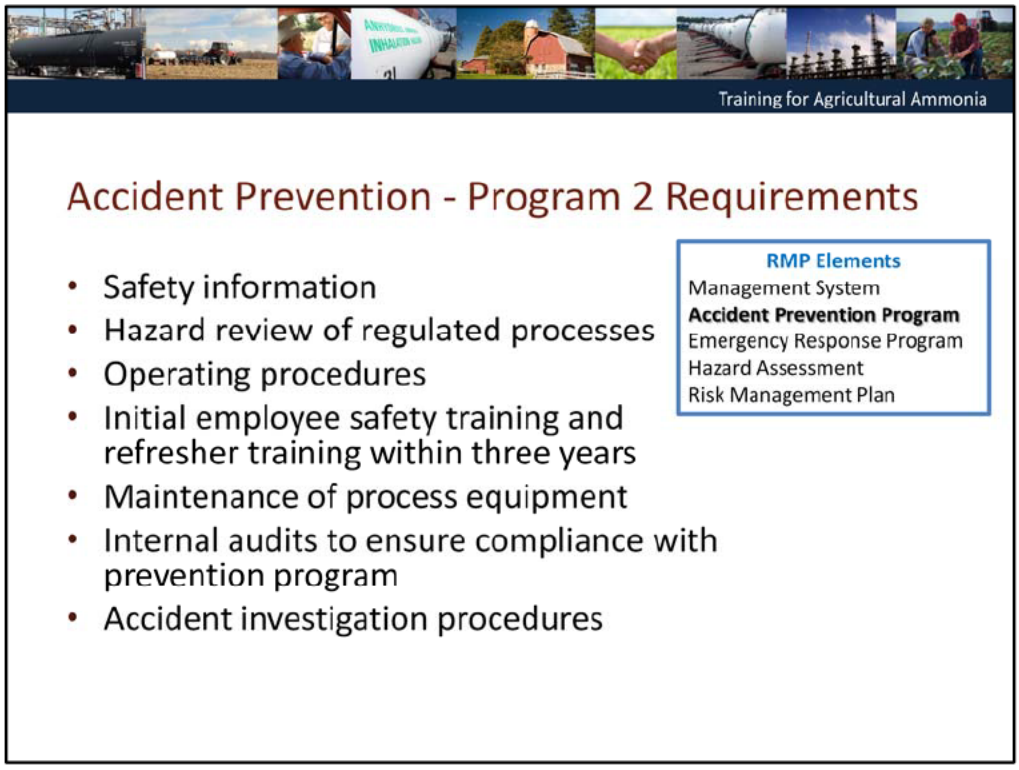
To help retail agricultural ammonia entities subject to the RMP, The Fertilizer Institute has developed, in conjunction with the Asmark Institute, a website with useful information and tools, called the myRMP Suite of Retail Guidance Materials. This site provides a variety of guidance material and interactive templates that you can use to develop site-specific risk management program documents for your facility.

At this site you can find a guidance manual for retail agricultural ammonia facilities which provides greater detail and context to the requirements covered by this training. The interactive tools available on this site may also be useful and we will make further reference to these tools as we step through the program elements.



As seen in the blue box in the upper right hand corner of this screen, the first element of your Risk Management Program is incorporation of a management system. This element of the RMP requires that your facility has identified personnel or a position that is responsible for your Risk Management Program, that you have documented the staff and their responsibilities as they relate to your program, and finally that you identify procedures to ensure that the management of your program is adequate.

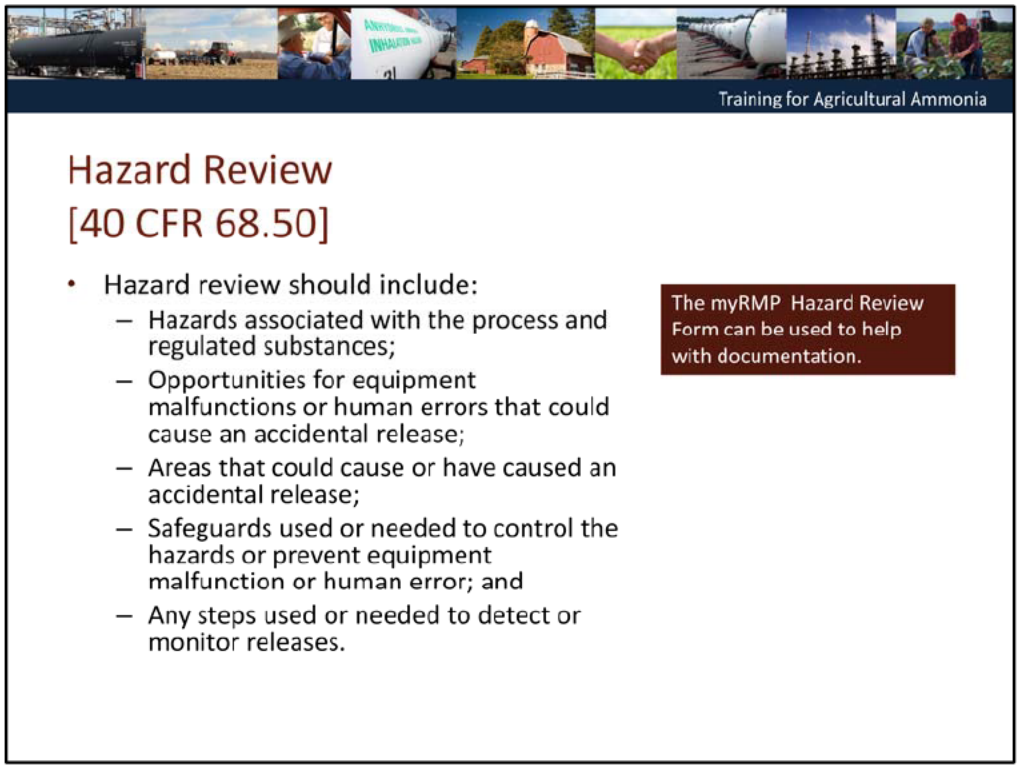
This can be done by specifying responsibility to staff for auditing the program and checking that hazard reviews are conducted and documented and that your program documentation is being updated as needed. Failure to audit your system or to complete and update the various requirements of the program are an indication that your management system is inadequate. The myRMP website tools for specifying operating procedures incorporates the various RMP responsibilities that need to be designated by your program.



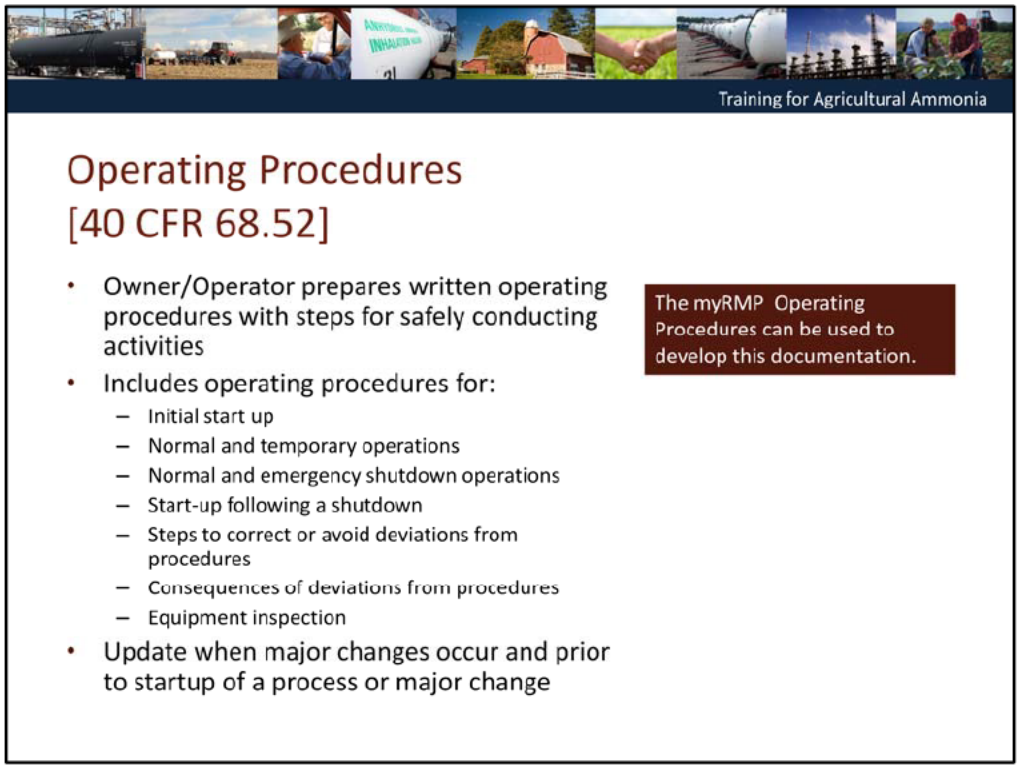
The next element of your Risk Management Program is the accident prevention program. The accident prevention program is made up of multiple components. These include the requirements to document and train facility staff on safety information, operating procedures, maintenance of process equipment, conducting internal audits, and accident investigation procedures. Next we will discuss each of these components.

The first component of your accident prevention program is safety information. The types of safety information that need to be included as part of your facilities Risk Management Program include current Material Safety Data Sheets or Safety Data Sheets for the RMP chemicals handled on-site, information on the maximum RMP chemical inventory at the facility, equipment specifications and information on upper and lower temperature and pressure requirements associated with chemical equipment and/or storage, as well as a summary of the local and national codes and standards that were used to design, build and operate your process.

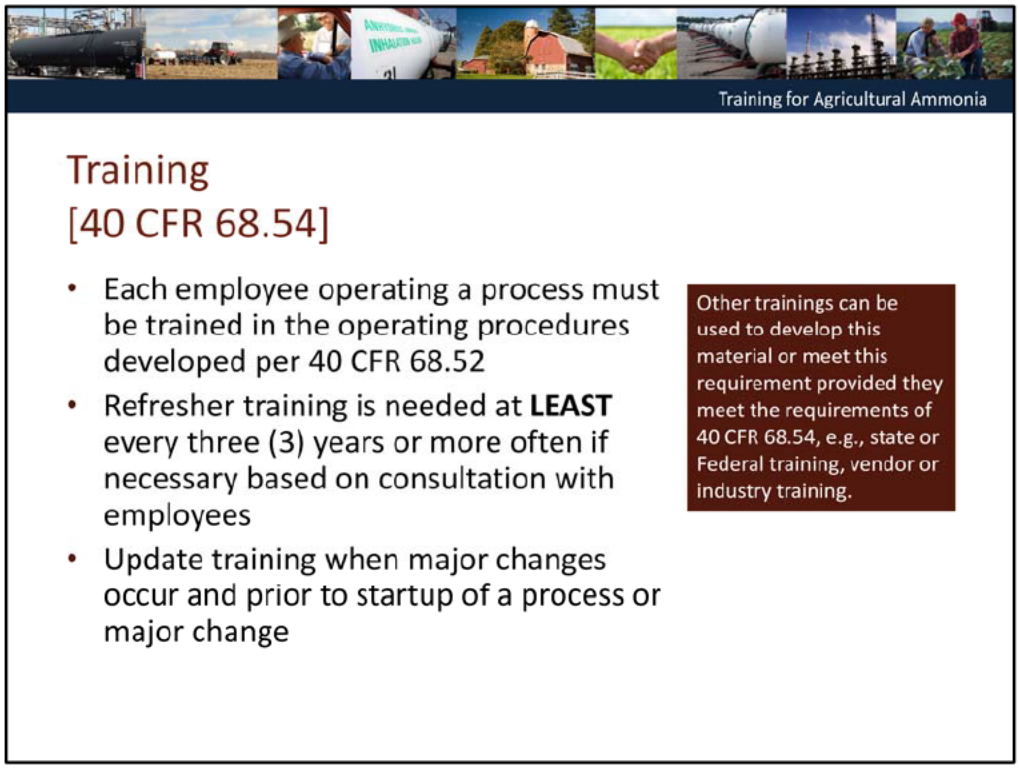
You should request and receive current Safety Data Sheets for the agricultural ammonia you purchase from your supplier. At the myRMP website you will find information on maximum chemical inventory and general chemical safety information in the "Hazard Review" link. Equipment specifications can be found on the website under the "Maintenance Manual" link. This link is useful if you have an older storage tank or vessel you need to know what standards or codes it was designed to at that time. For example, depending on when the tank was constructed it may meet ASME Section 8 design and construction requirements.



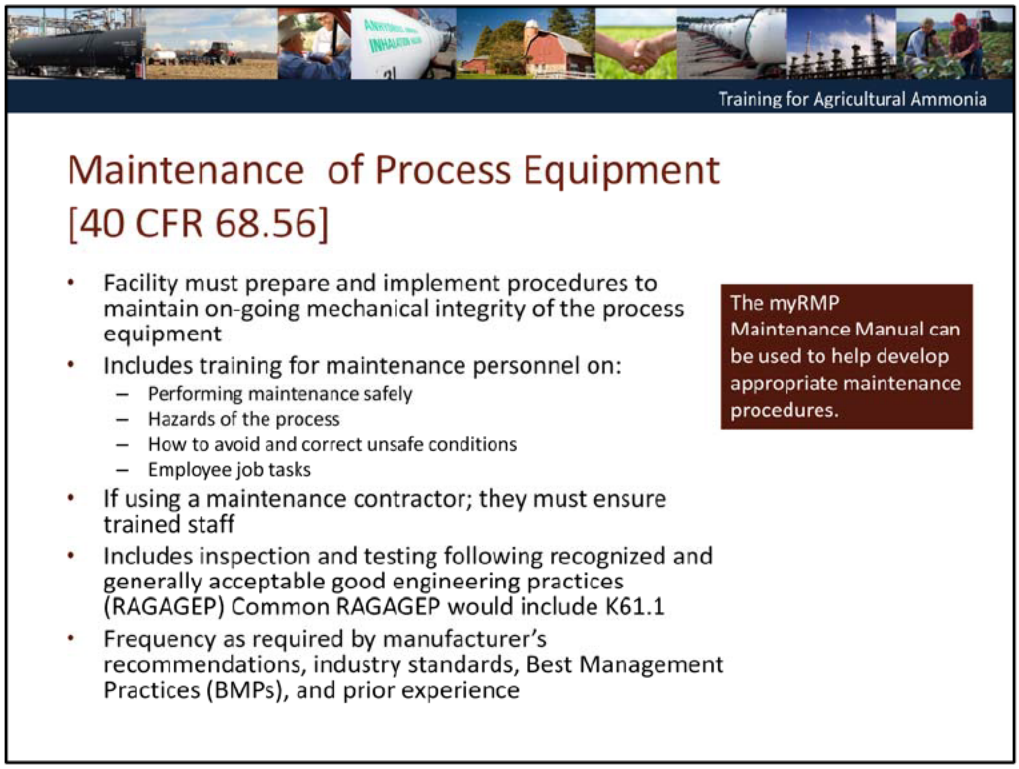
The next component of the Accident Prevention program for your facility is a hazard review. This review will include an evaluation of the hazards that are associated with your specific processes and chemicals, potential equipment malfunctions or human errors that could result in an accidental release of ammonia, identification of the safeguards needed to control potential hazards, and steps needed to detect or monitor for ammonia releases. The myRMP website includes a "Hazard Review" form that you can use to help develop and document the hazard review of your specific facility, but note that it may not cover all of the hazards for review by your facility and will have be to tailored to meet your specific needs.



Another key component of the Accident Prevention Program for your facility is to develop and document for your staff appropriate operating procedures for the handling of ammonia at your site. The myRMP website includes an "Operating Procedures" link to help you prepare written operating procedures. These procedures will cover operations from start up to shut down, should include equipment inspection procedures, and should also identify for staff the consequences that could result if there are deviations from the prescribed operating procedures. It is also important to remember that when you have system or procedure changes, these need to be reflected in the written operating procedures and the RMP requirements direct you to update your procedures to reflect these changes.

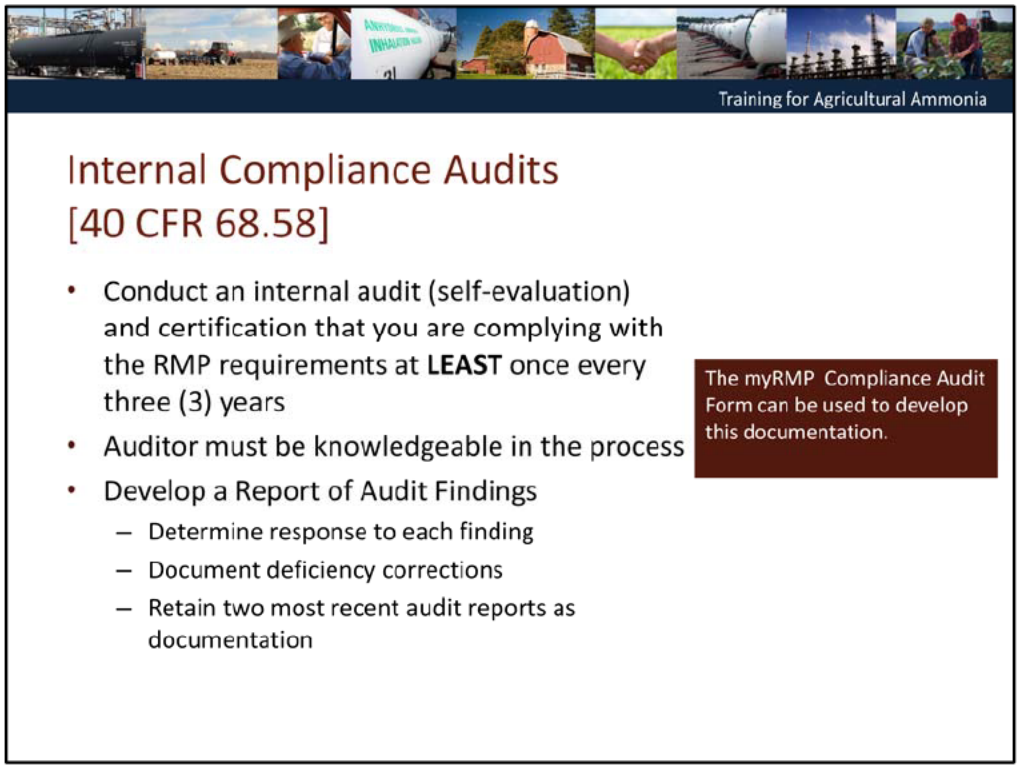


Vital to any Accident Prevention Program is the proper training of staff. Under the RMP requirements, each employee operating a process using an RMP chemical must be trained in the operating procedures that apply. This training must be conducted at least every three years or more often if necessary based on consultation with the your employees. The training must be updated when there are major changes to the process or before a process startup. Keep in mind that you can use information from other similar trainings, for example vendor training, to help craft the training that applies to your operation. But it is also important to note that your training must be specific to your operating procedures and not just anhydrous ammonia safety procedures.

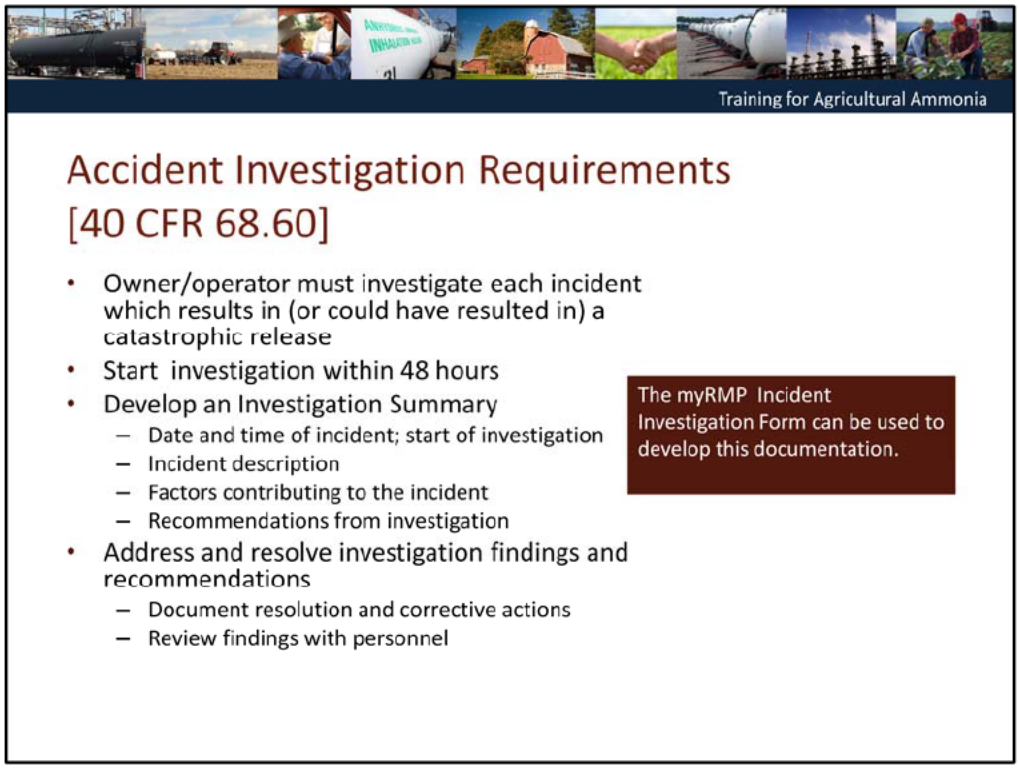


An additional requirement under the Accident Prevention Program is the development of maintenance procedures applicable to ammonia handling and storage at your facility. The myRMP website includes a "Maintenance Manual" tool that can be used to help develop the appropriate maintenance procedures for your operation. These procedures should address on-going maintenance of your process equipment, training for your personnel on proper maintenance procedures, and inspection and testing of process equipment following recognized and generally acceptable good engineering practices which are also referred to as RAGAGEP. For example, pressure relief valves should be replaced every five years or more often if required.

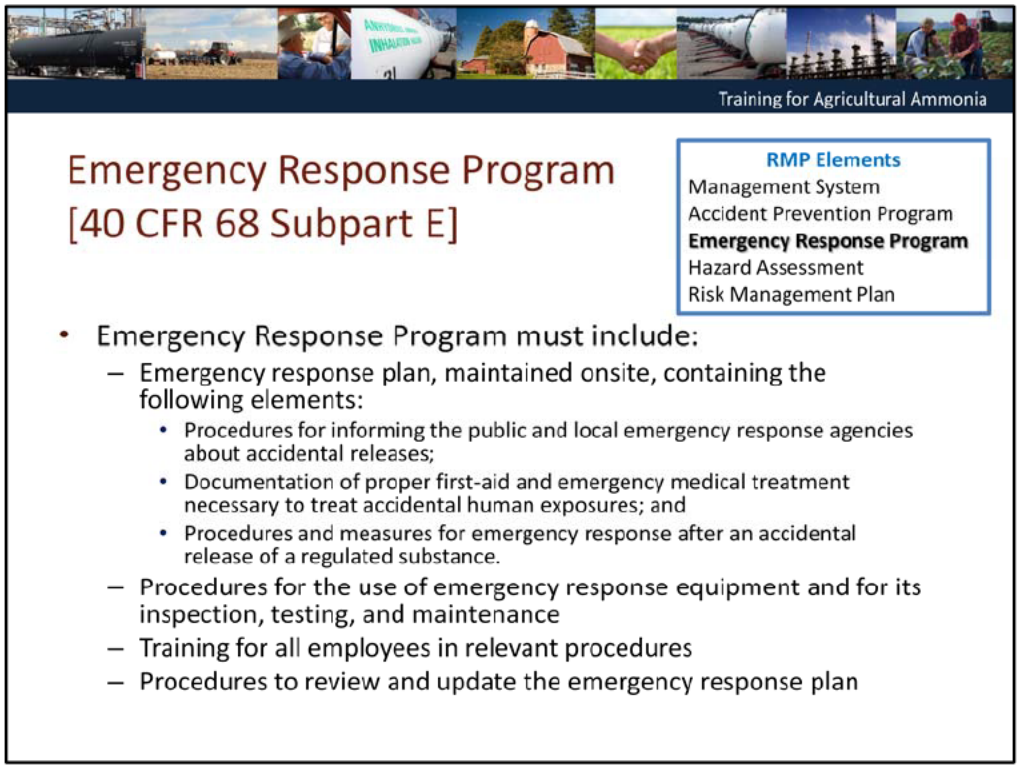
Common RAGAGEP are included in the ANSI K61.1 standards. Note that if you use a maintenance contractor instead of your own staff to maintain process equipment, your program needs to include mechanisms to ensure that the contractor staff are properly trained.



To ensure that your facility has implemented the Risk Management Program requirements, you should perform an internal compliance audit of your program at least once every three years. It is important that the staff identified to conduct the audit are experienced in the operations at your facility and the myRMP website includes an internal compliance audit checklist that can be used to document the audit and the audit findings. At the completion of the audit you should prepare a Report of Audit Findings. This report should summarize any of the audit findings and your planned response to address any deficiencies that were identified. You need to keep your two most recent audit reports as part of your files.



If there should be an accident at your facility related to your ammonia handling and storage, you are required to investigate the incident and prepare written documentation on what happened and the response to it. The owner or operator of the facility is required by the Risk Management Program to investigate any incidents that result in or could have resulted in a catastrophic release. These investigations should commence as quickly as possible and within 48 hours of the incident. You are required to develop an investigation summary with specific details, such as the date and time of the incident, a description of what happened, factors that caused the incident, and recommendations that result from the investigation. The investigation recommendations should include concrete resolution steps to avoid anything similar from occurring again and you should document in writing what the resolution steps are and when they will be implemented. These findings should be reviewed with facility personnel.



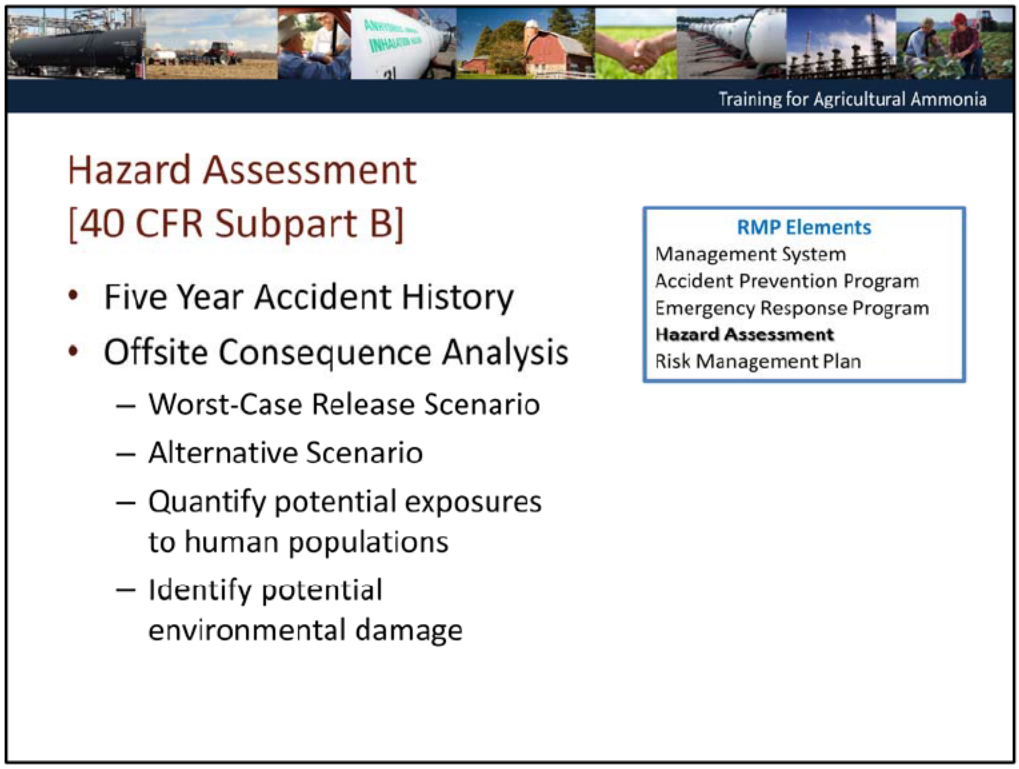
The next main element of your Risk Management Program is the development and implementation of an Emergency Response Program. The Emergency Response Program needs to include an emergency response plan and procedures to review and update the plan as needed. The content of the plan includes procedures for informing the public and your local emergency personnel of an accidental ammonia release, identification of proper first aid and emergency medical treatment associated with human exposures to ammonia releases, and the appropriate emergency response for an accidental ammonia release. Keep in mind that your emergency response plan needs to be maintained on-site and updated if and when circumstances at the facility change. Other components of your Emergency Response Program include procedures for the use of emergency response equipment and how that equipment will be maintained, inspected, and tested as well as training for your facility staff on relevant emergency procedures.

Emergency Response Program [40 CFR 68 Subpart E]

- Applicability - an emergency response program is not required if:
  - The employees of the facility will not respond to accidental releases of regulated substances;
  - Appropriate mechanisms are in place to notify emergency responders when there is a need for a response; AND
  - The stationary source is included in the community emergency response plan developed as part of EPCRA emergency planning requirements.

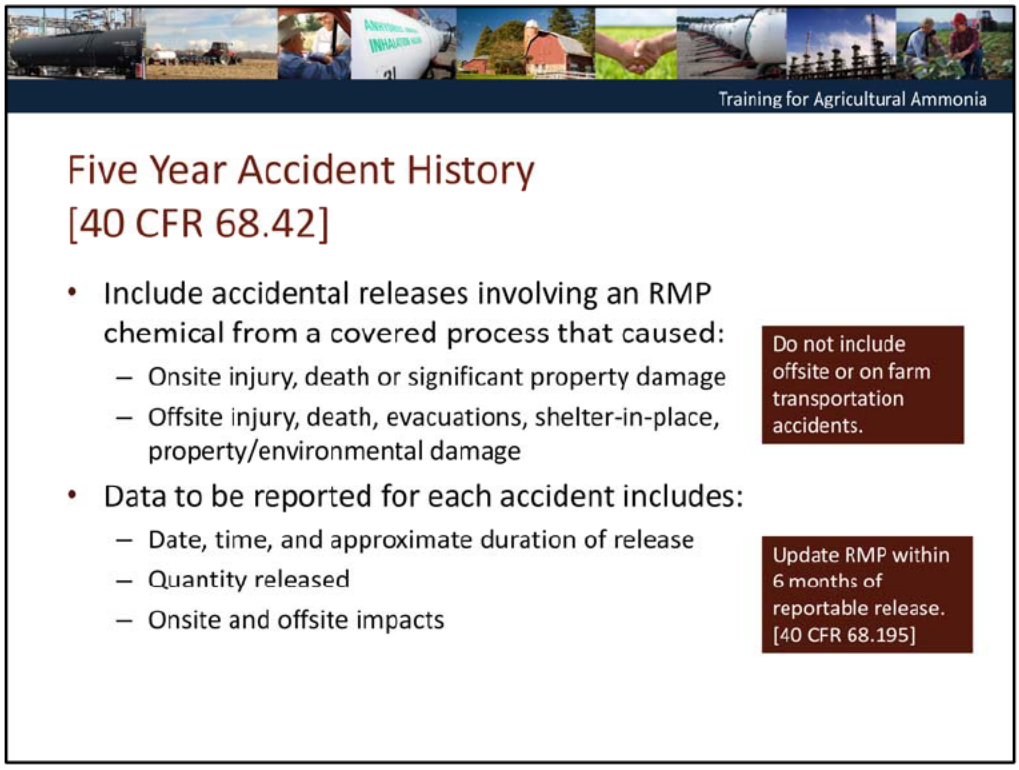
The requirement to develop your own Emergency Response Program may not apply if your facility meets the following conditions:

First, that your facility personnel would not respond to any accidental ammonia releases, instead appropriate mechanisms must be in place to notify your local emergency responders for a response. Also, your facility needs to be included in the community emergency response plan developed as part of the EPCRA emergency planning requirements.



As part of developing your facilities Risk Management Program, you need to conduct a hazard assessment. The hazard assessment includes a five year summary of accidents at your facility involving ammonia handling and storage along with an off-site consequence analysis. The purpose of the off-site consequence analysis is to quantify what the potential exposures could be to the public if there were to be an accidental ammonia release at your facility. The assessment also evaluates environmental impacts as well.

The off-site consequence analysis looks at a worst-case scenario as well as an alternative scenario and may be conducted by your staff or contracted out to a third party to perform the assessment for your facility. Over the next few slides we will talk in more detail about what needs to be included in your five year accident history and in the off-site consequences analysis as well as identify resources to help you with these requirements.



The five year accident history needs to include a listing of all accidental releases of ammonia, from your RMP covered process, that resulted in onsite property damage, injury, or death. The list should also include any accidental releases that resulted in offsite evacuations, requirements to shelter-in-place, property damage or environmental damage, injuries, or deaths. The data for each accident that should be included with the history are the date, time, and duration of the accidental release, an estimate of the quantity released, and a description of on-site and off-site impacts. Also, keep in mind that you need to update your Risk Management Program within six months of a reportable release to incorporate revised operation procedures for the prevention of similar accidents.

Offsite Consequence Analysis (OCA) [40 CFR 68.22 and 68.165]

- Your OCA should be reviewed and updated every 5 years [40 CFR 68.36]
  - Check if public receptors have changed
  - Analysis should be based on location of tanks, not latitude/longitude of facility
- Your OCA should be updated within 6 months if RMP chemical inventory has been added that could increase the distance to the endpoint by a factor of 2 or more

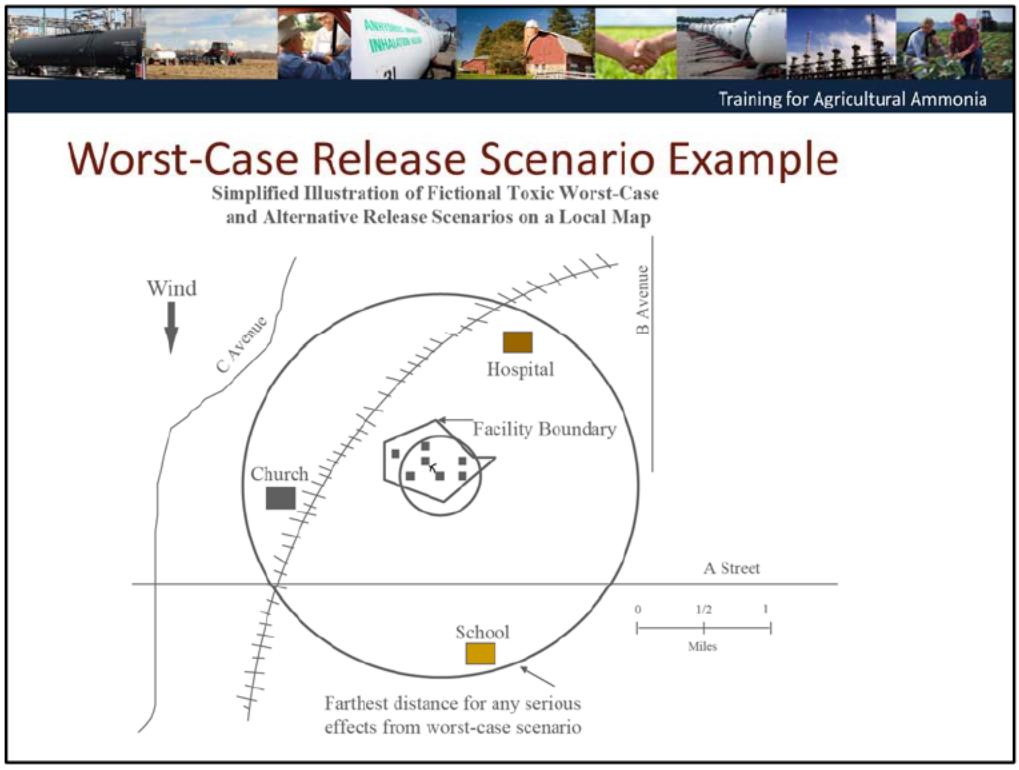
The off-site consequence analysis conducted for your facility and process should be updated at least once every five years. The analysis will need to be updated more frequently, and within 6 months, if you have added RMP chemical inventory that could increase the distance to the endpoint by a factor of two or more. When updating the analysis consider whether your public receptors may have changed and whether the analysis is based on the actual location of your ammonia containing tanks and not just the latitude and longitude of the facility.

Offsite Consequence Analysis

- EPA has developed resources to assist with offsite consequence analysis:
  - RMP*Comp (http://www.epa.gov/osweroe1/content/rmp/rmp_comp.htm)
  - RMP Guidance for Offsite Consequence Analysis (http://www.epa.gov/oem/docs/chem/oca-chps.pdf)

The myRMP website also contains a method to determine OCA endpoint distances based on the DEGADIS atmospheric dispersion model. (https://www.asmark.org/myRMP/Forms/DEGADIS.pdf)

To help entities comply with the off-site consequence analysis requirement, EPA has developed a Website and guidance. The URLs to access these resources are highlighted on this slide. The myRMP guidance also contains a method to determine offsite consequence analysis distances based on a dense gas atmospheric dispersion model.



This illustration provides an example of what the output from your worst-case off-site consequence analysis might look like. This illustration shows the facility boundary and ammonia tank locations, the prevalent wind direction and subsequent areas that would be affected by a worst-case and alternate-case ammonia release. The potentially affected areas are shown in relation to public exposure sites such as schools, churches, hospitals, and residential areas.

Training for Agricultural Ammonia

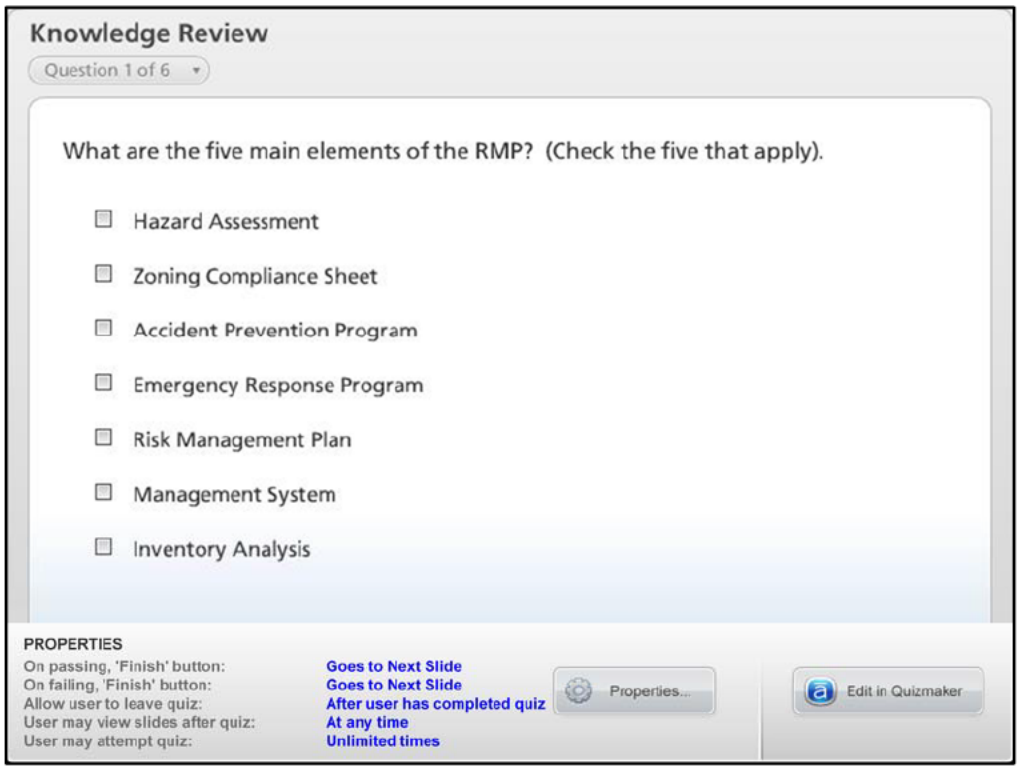
Risk Management Plan [40 CFR 68 Subpart G]

RMP Elements
Management System
Accident Prevention Program
Emergency Response Program
Hazard Assessment
Risk Management Plan

- Executive Summary of Risk Management Program
- EPA Registration: Facility ID, location, lat/long, chemical process info (e.g., NAICS, chemical name, CAS #, quantity)
- 5-year history of accidental releases
- Offsite consequence analysis: Worst-case & alternative release scenarios
- Accident prevention program: hazard analysis methods, mitigation measures
- Emergency response planning information

The final element of the Risk Management Program is the development of your risk management plan. This plan includes an executive summary of your Risk Management Program and presents in one document the basic EPA program registration data for your facility, your five year accident history and off-site consequence analysis, as well as a description of your accident prevention program, your hazard analysis methods and mitigation measures, and your emergency response planning information.

This document is part of the documentation that you need to maintain on-site at your facility. This plan along with safety data sheets for your RMP chemicals, your Hazard Review, your written operating procedures, and documentation of your internal compliance audits and any incident investigation reports should be easily available in case of a compliance audit by EPA. It is also important to keep your Risk Management Plan up-to-date, including contact information which must be updated within one month of any change.


Knowledge Review
Question 1 of 6
What are the five main elements of the RMP? (Check the five that apply).
Hazard Assessment
Zoning Compliance Sheet
Accident Prevention Program
Emergency Response Program
Risk Management Plan
Management System
Inventory Analysis
PROPERTIES
On passing, 'Finish' button: Goes to Next Slide
On failing, 'Finish' button: Goes to Next Slide
Allow user to leave quiz: After user has completed quiz
User may view slides after quiz: At any time
User may attempt quiz: Unlimited times
Properties...
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Section 4: Anhydrous Ammonia Retailer RAGAGEP

- Operator Protection
- Maintenance and Repair
- Annual Inspection
- Hose Replacement
- Ammonia Transfer

In this next section, we would like to discuss recognized and _enerall_ acceptable good engineering practices that relate to the handling and storage of agricultural ammonia. The specific topics will include, operator protection, maintenance and repair, annual inspections, hose practices, and practices associated with ammonia transfers.

Operator Protection RAGAGEP

- Recommended minimum protection for operators handling ammonia:
  - Chemical splash goggles [ANSI K61.1 3.2]
  - Protective gloves [ANSI K61.1 3.2]
- Additional protection for bulk ammonia storage [ANSI K61.1 3.4]
  - One set rainsuit or slicker, protective gloves, and protective boots
  - Two full-face gas masks with ammonia canisters for emergency work
  - Access to an emergency shower and eye wash

Recognized and _enerall_ acceptable good en_ineerin_ practices related to protecting the operators of your facility include recommended minimum personal protective gear, such as the use of chemical splash goggles and the use of protective gloves when handling equipment associated with ammonia storage and transfer. Face shields may also be worn but do not take the place of splash goggles. The American National Standards Institute, ANSI standard K61.1 section 3.2 requires that any person making, breaking, or testing an ammonia connection, transferring ammonia, or performing maintenance and repair on an ammonia system under pressure shall wear protective gloves, and chemical splash goggles.

In addition ANSI standard K61.1 section 3.4 requires permanent storage installations to have at least one rainsuit with protective gloves and boots as well as full-face gas masks with ammonia cartridges available at any location with bulk ammonia storage in case of an emergency.

Additional Safety Requirements

- All cargo tanks for carrying anhydrous ammonia must carry per ANSI K61.1 3.5:
  - At least five gallons of clean water for flushing eyes and skin in case of exposure. [You should change water daily to ensure a clean supply]
  - A pair of protective gloves
  - A full-face gas mask with ammonia cartridge and a spare cartridge
  - Chemical splash goggles
- Minimizing the potential for explosion - the fertilizer industry has historically minimized explosion hazards by not allowing anhydrous ammonia to be stored indoors or in confined areas

Additional safety precautions include keeping clean water with any farm vehicle or tractor carrying ammonia so that if there is an accidental ammonia exposure, the victim can flush their eyes and skin. Cargo tanks that transport ammonia should also include protective gloves, splash goggles, and a full-face gas mask with ammonia cartridge for use by the operator in case of a release. To help minimize the potential for explosions, anhydrous ammonia should not be stored indoors or in confined areas.

If an ammonia release occurs that affects facility personnel, first move them to a safe area, and then proceed with flushing of the skin and eyes as needed.

Training for Agricultural Ammonia

Maintenance RAGAGEP

Fertilizer Institute guidelines for maintenance include:

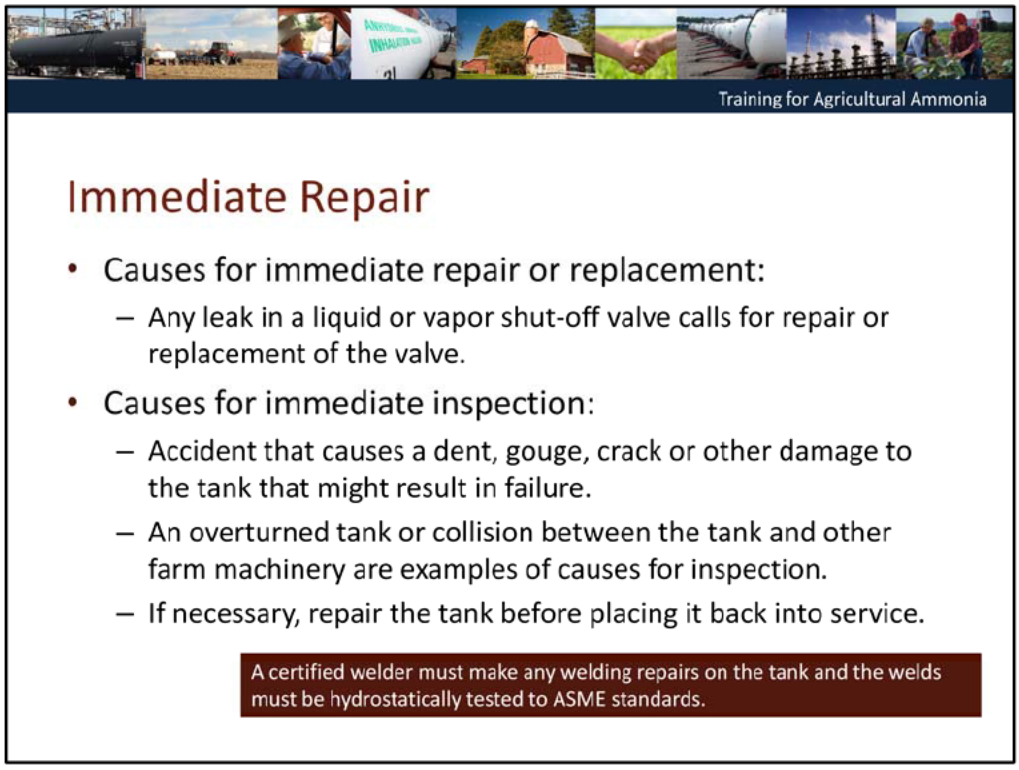
- Brief daily inspection of tanks and hoses.

Don't use nurse tanks with faulty gauges.

- For nurse tanks, check the functionality of the liquid level gauge and pressure gauge.
- Tires: inspect for proper inflation, cuts, weathering, wear and tightness of lug bolts on wheels.
- Hoses: check for cuts, soft spots, bulges, kinking, flattening or slipping at the coupler.
- To repair or replace faulty gauges, the tank must be emptied and the tank pressure dropped to zero before faulty parts can be removed.

Next we would like to talk about best practices related to the maintenance of agricultural ammonia equipment. Proper equipment maintenance starts with regular equipment inspection. For agricultural ammonia handling and storage this includes brief daily inspection of the ammonia storage containers and hoses.

Nurse tanks should be checked for gauge functionality before they are filled, including both the level and pressure gauges. Portable tanks should be mounted on carriers with properly inflated tires and inspection of the tires should be conducted to ensure that there are not conditions that would be likely to lead to transport accidents, such as cuts or undue weathering of the tires or loose lug bolts. Hoses should also be checked for damage for bulges and any connection problems such as slipping at the coupler. Note that before any repairs can be made to the equipment, it must be fully emptied and any pressure dropped to zero first.



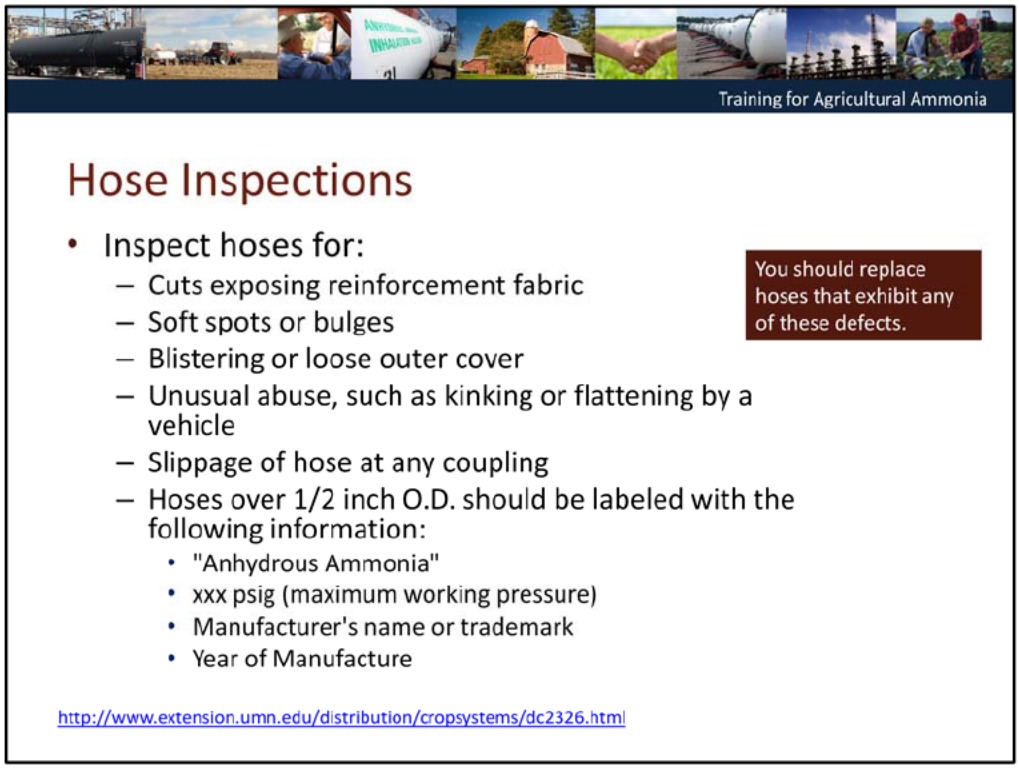
There are some conditions that may be identified during regular equipment inspections that will require immediate repairs. Examples include:

• Any problems with a liquid or vapor shut off valve;

• Identification of dents, gouges, cracks or other damage to an ammonia tank or vessel that could lead to a vessel failure; or

• Any collision between ammonia storage or handling equipment and other farm equipment that results in damage to the ammonia equipment.

Note that tank damage welding repairs will require a certified welder for the fix and the tank will need to be re-tested to meet AMSE standards before it can be put back into use.



Ammonia hoses should be checked regularly and inspected carefully for cuts that expose the reinforcement material, soft spots or bulges in the hose line, blistering or loosening of the outer hose cover, or unusual damage from kinks or flattening.

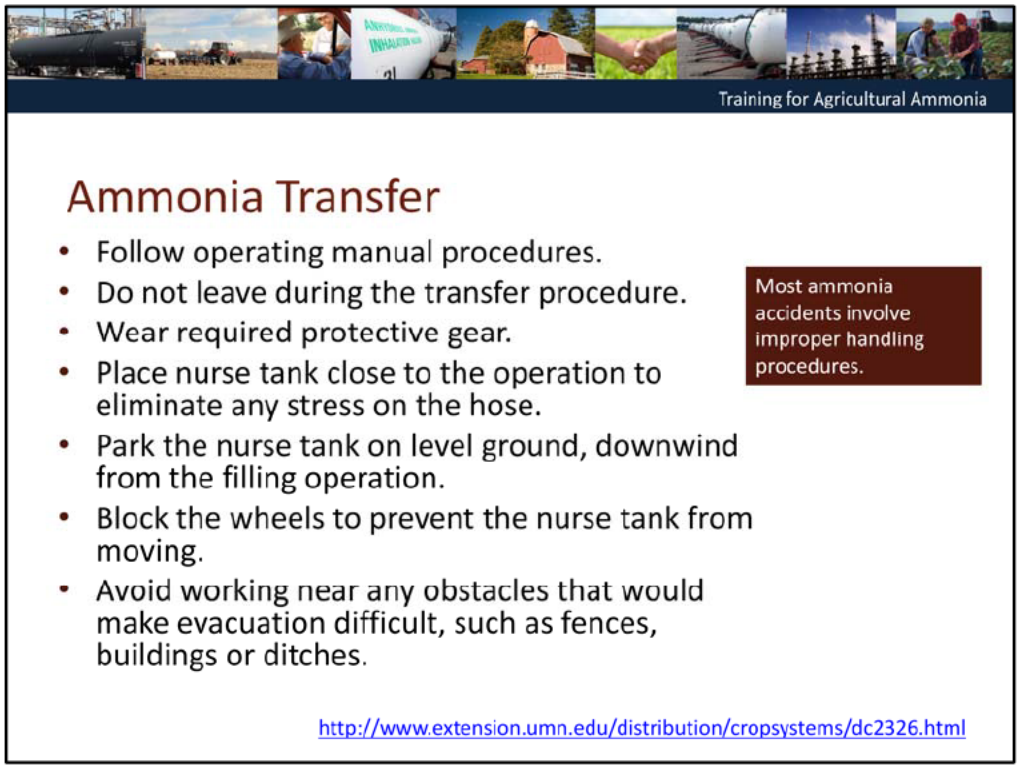
Hoses with an outside diameter greater than half an inch should also be labeled with the manufacturers trademark, year of manufacture, maximum working pressure, and the hose contents. Hose couplings also need to be inspected along with any brass or copper fittings or hose clamps. If problems are identified during these inspections the equipment should be replaced.

Hose Replacement

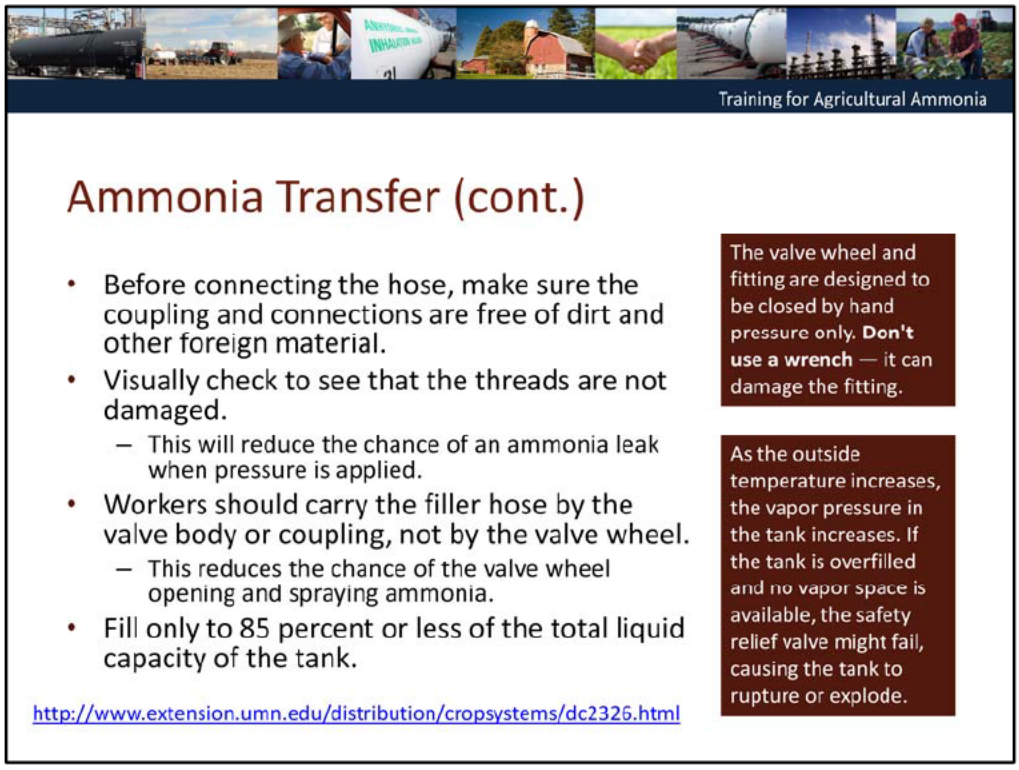
- Recommend that you replace hoses according to the following schedule:
  - Nylon/Kevlar: Four years
  - Stainless steel: Six years
- Replace hoses more frequently if damage/problems are identified during hose inspection

http://www.extension.umn.edu/distribution/cropsystems/dc2326.html

If regular hose inspections do not identify any problems, then you should plan on replacing your anhydrous ammonia hoses on a regular schedule. Nylon or Kevlar hoses should be replaced every four years, and stainless steel hoses should be replaced every six years.

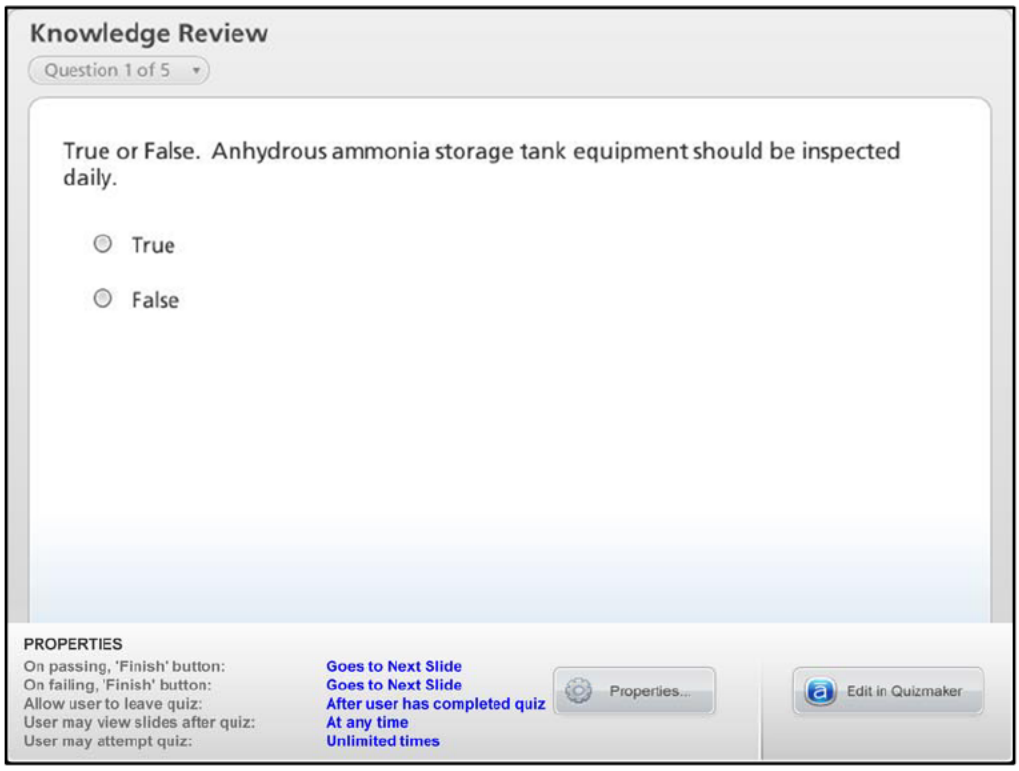


There are also some good practices to always follow when conducting ammonia transfer operations. These include following manufacturers operating procedures and using required personal protective gear. Your facility operators should also pay attention so that transfer operations are always monitored and staff use good judgment in the placement of mobile tanks so that they are on level ground, chocked in place, and close enough to minimize stress on the connections and tanks. In addition, your facility staff should always keep safety in mind and avoid working near obstacles that would make it difficult for them to evacuate in case of an accidental release.



With respect to connection hoses, your staff should always check the hose connections for wear, dirt, or debris before they make a connection to a tank. Workers should also always carry the filler hose by the valve body or coupling and NOT by the valve wheel. This will reduce the chance of a valve wheel opening and releasing ammonia. Finally, during transfer operations, a tank should never be filled more than 85 percent of its liquid capacity.

Overfilling is particularly dangerous during warm weather conditions when pressures in the tanks will be highest. You do not want to trigger a pressure relief valve and subsequent ammonia release, or if the pressure relief valve should fail it could cause an explosion. Since most accidents of agricultural ammonia involve improper handling procedures, proper training and adherence to your operating procedures and best management practices are key to keeping a safe and accident free work place.


Knowledge Review
Question 1 of 5
True or False. Anhydrous ammonia storage tank equipment should be inspected daily.
True
False
PROPERTIES
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User may view slides after quiz: At any time
User may attempt quiz: Unlimited times
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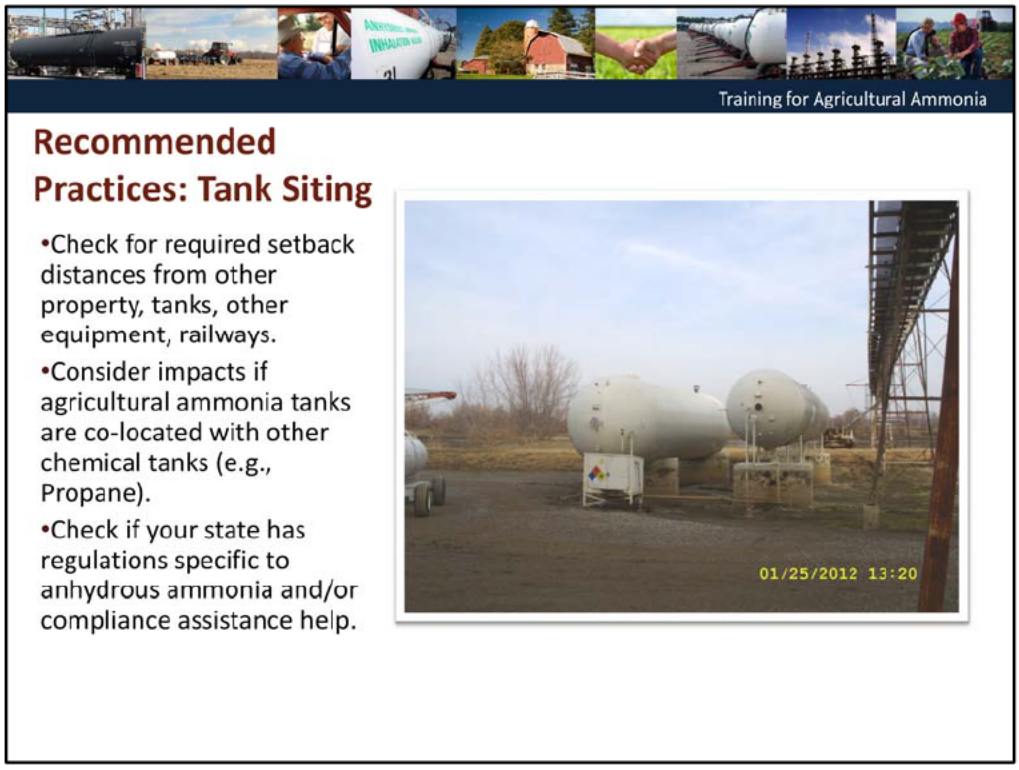
Section 5: Recommended Practices and Case Studies

- Tank siting
- Vehicle barriers
- Saddle configuration
- Breakaways
- Corrosion
- Hose rupture

For the next several slides, we would like to emphasize recommended practices that have been identified by EPA's RMP inspectors as topics of particular concern and will also present a few case studies that document what can happen when a facility is not complying with the requirements of the RMP and why good practices are so important. The topic areas we will discuss include ammonia tank siting, vehicle barriers, saddle configurations for storage tanks, breakaways, tank and piping corrosion, and avoiding hose ruptures.



When siting any ammonia storage tank, it is important to give due consideration to where the tank will be placed and the situation around that area. As a first, step you should be checking for any required setbacks that apply. Setbacks require minimum distances between the storage tank and property lines, railroad tracks, and/or other tanks and equipment.

These setbacks may be set by state regulation and/or state or county fire codes. For example states like Indiana, Minnesota, and North Dakota all have requirements specific to anhydrous ammonia storage. Another consideration for your ammonia tank siting will be co-location of tanks at your facility and how that may impact any release events or emergency situations. If a hazmat team needs to get to an anhydrous ammonia tank as part of a response, it's important that they can access the tank area.

Recommended Practices: Vehicle Barriers

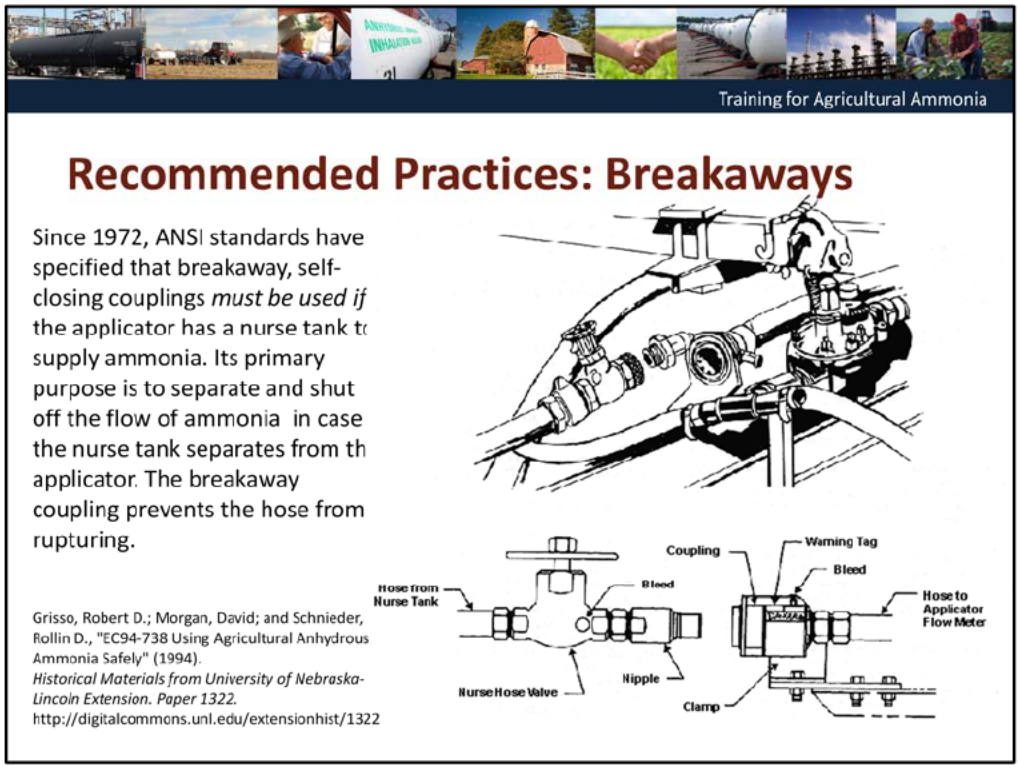
Stationary containers and attached components and/or accessories should be located and protected by barriers to avoid damage by trucks or other vehicles. [ANSI K61.1 9.4 and 10.1]

Example of a tank without any vehicle barriers to protect the tank and its piping

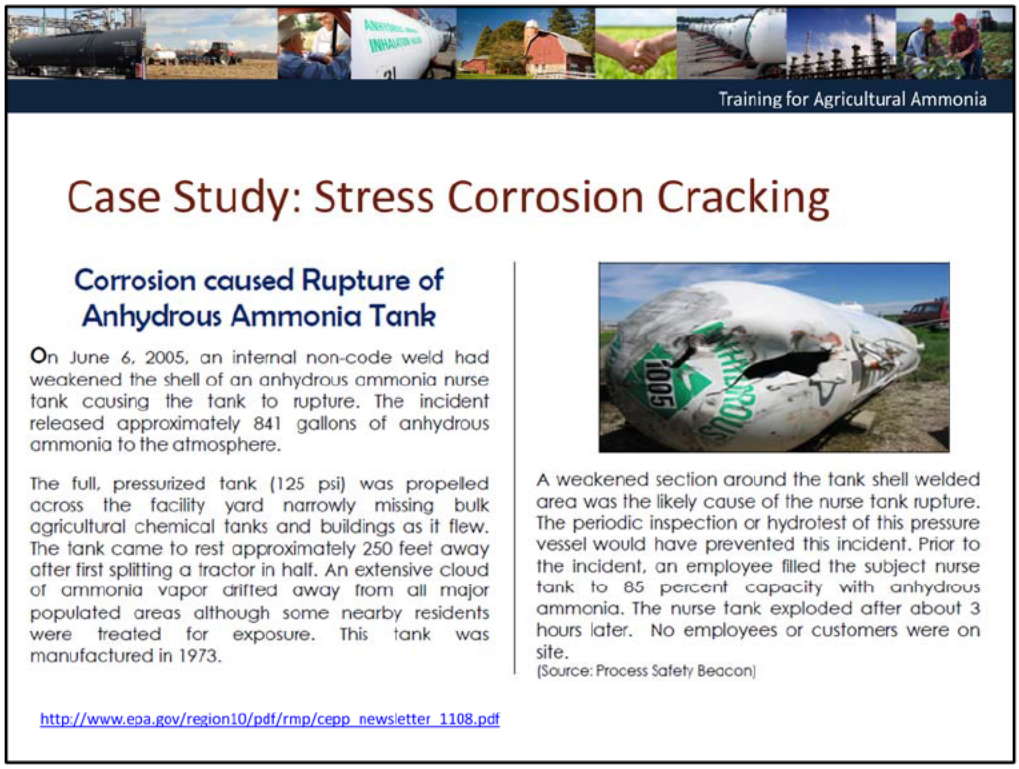
Next we would like to discuss the importance of installing and maintaining vehicle barriers around stationary ammonia storage tanks. Unprotected tanks and associated piping and components can sustain significant damage and easily lead to accidental ammonia releases if struck by a moving truck or other equipment at the facility. Posts or other barriers of adequate strength must be installed to protect exposed system piping. The location of the tank and associated piping systems should also be evaluated for traffic/safety concerns and consistent with local codes.

Another important component for stationary aboveground ammonia tanks is the tank saddle. In all cases, a stationary ammonia storage tank should be supported at least 18 inches above the ground or higher if it resides in a flood plain. Additionally, footings and foundations for tank saddles should extend below the established frost line for that area. The structural integrity of the tank saddle is very important since saddle integrity can jeopardize the stability of the tank. A common example is when a steel tank support becomes highly corroded and results in collapse of the tank.

Tank saddle sizing should allow for expansion and contraction of the tank with temperature variations and the placement of the tank on the saddle should distribute the tank weight so that excessive loads are not placed on any given area of the tank shell.

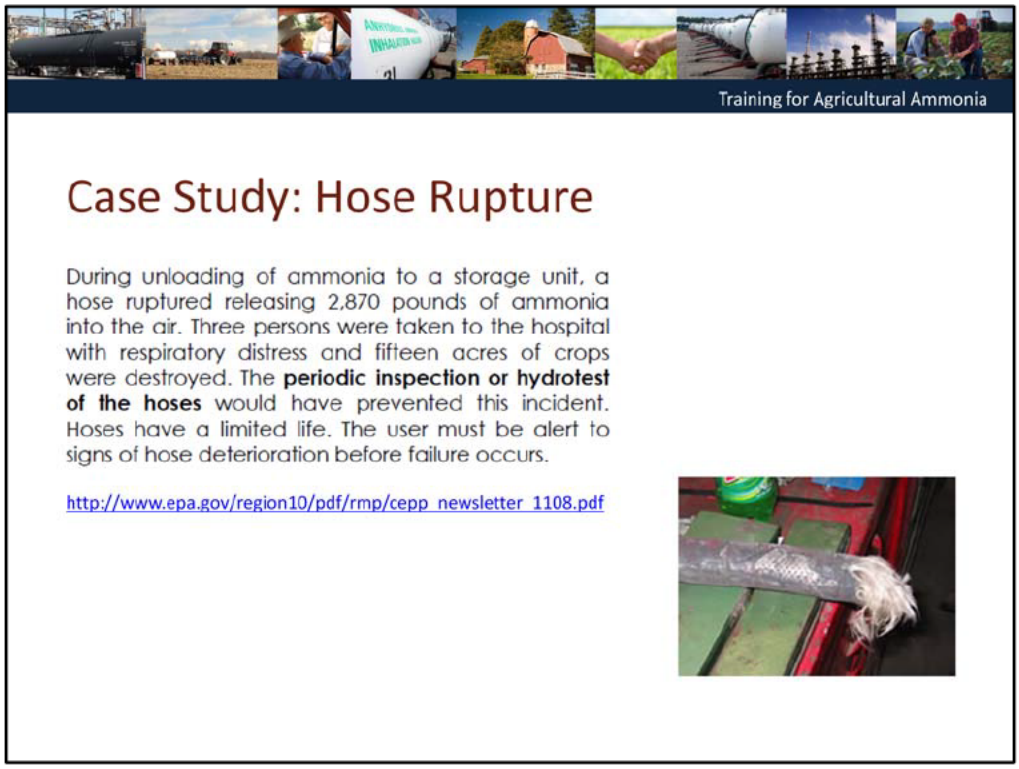


For piping connections to nurse ammonia tanks, ANSI includes standards that are specific to the couplings used. The standards specify that breakaway, self-closing couplings must be used if you are using a nurse tank to supply ammonia. The primary purpose of the breakaway is to guard against significant ammonia releases if the nurse tank should separate from the applicator equipment. These types of couplings are illustrated in the following schematic shown here.



An important maintenance issue to look for as part of regular inspections is corrosion of tanks and piping components. Corrosion of your equipment should be addressed proactively and repairs made as needed. Excessive corrosion of your equipment can lead to life threatening accidents. As an example, in 2005 a pressurized anhydrous ammonia nurse tank that had recently been filled to 85 percent of its capacity, ruptured within a few hours of being filled, and resulted in a release of over 840 gallons of ammonia. The rupture propelled the pressurized tank over 250 feet away, crashing through a tractor and narrowly missing other chemical tanks.

There was a resulting ammonia cloud released which caused ammonia exposures by nearby residents and the facility was very fortunate that the prevailing wind direction at the time of the accident was away from nearby populated areas. The source of the rupture was found to be a weakened section of the tank shell around a non-code weld. Inspection of the tank or hydrotesting of the pressure vessel would have prevented this incident.



Ammonia hoses and connections are another area where proper maintenance is key. In this case study, an ammonia hose ruptured during use and over 2,800 pounds of ammonia were released. This incident injured three people and destroyed over 15 acres of crops. As discussed previously, hoses have a limited life and ty should be inspected regularly and replaced as needed or at recommended intervals.

Preparing for an EPA RMP Inspection

Maintain copies of the following documents:

- Most recent Risk Management Plan (within last 5 years)
- Written operating procedures
- Most recent safety data sheets
- Hazard Review
- Two most recent compliance audits
- Incident investigations for any accident, especially if it resulted in injury or off-site evacuation/shelter in place
- Facility Emergency Response Plan (if applicable)

The focus of this presentation has been to provide guidance and best practice information to support agricultural ammonia suppliers in complying with EPA's RMP requirements. To help reinforce these requirements, we will discuss how you can prepare for an RMP inspection.
As discussed previously, there are a number of documentation requirements under the Risk Management Program. The purpose of these requirements is to document that you are planning for and implementing a program that will help avoid ammonia-related accidents and damage at your facility and to ensure the safety of those around you. During an inspection, you can expect the RMP inspector to ask to see your on-site documentation. They will be looking for the following:

• Your most recent risk management plan, which should have been updated within the past five years;

• Your written facility operating procedures;

• Current Material Safety Data Sheets for the chemicals used or stored at your facility including the sheet from your ammonia supplier;

• Documentation of your hazard review for your facilities operations;

• Your two most recent internal compliance audit reports;

• Any incident investigations reports if applicable; and

•Your facilities Emer enc Response Plan, if applicable.

Preparing for an EPA RMP Inspection (cont.)

- Conduct the following activities on a routine basis:
  - Coordinate accident prevention efforts with local first responders.
  - Perform equipment maintenance and inspections.
  - Provide initial employee training and refresher trainings.
  - Demonstrate compliance with current industry standards (for example, 1999 version of ANSI K61.1) by implementing the new standards, planning for them, or documenting that they are not needed.

The RMP inspector will also be checking to ensure that you have done the following:

• Coordinated your accident prevention procedures with your local first responders;

• That you have regular maintenance and inspection of your ammonia tanks and associated equipment;

• That you are providing your facility personnel with required training and refreshers; and

• That you have documented your compliance with the RMP and other applicable standards through planning, implementation, and documentation.

Preparing for an EPA RMP Inspection (cont.)

Preventive measures inspectors will be looking for:

- Vehicle barriers
- Emergency shutoffs
- Emergency breakaways at risers
- Proper paint (to avoid excessive rust)
- Hoses/relief valves that are not out of date (5 year replacement)
- Warning labels
- Emergency water sources
- Bulkheads
- Tanks elevated 18 inches or more off the ground
- Proper saddle configuration
- Underground pipe testing procedures and records

As the RMP inspector reviews your paperwork and does a visual inspection of the site, they will also be looking to see if you have implemented the following types of preventative measures:

• The use of vehicle barriers around stationary ammonia tanks;

• That your tanks have emergency shut offs and emergency breakaways at the risers;

• That tanks are properly painted and free of excessive rust and that other piping components are free of excessive rust;

• That your hoses and relief valves are not out-of-date or obviously damaged;

• That you maintain emergency water with your mobile equipment and proper warning labels as needed;

• They will also inspect your tanks for any siting concerns and for proper saddle configurations; and

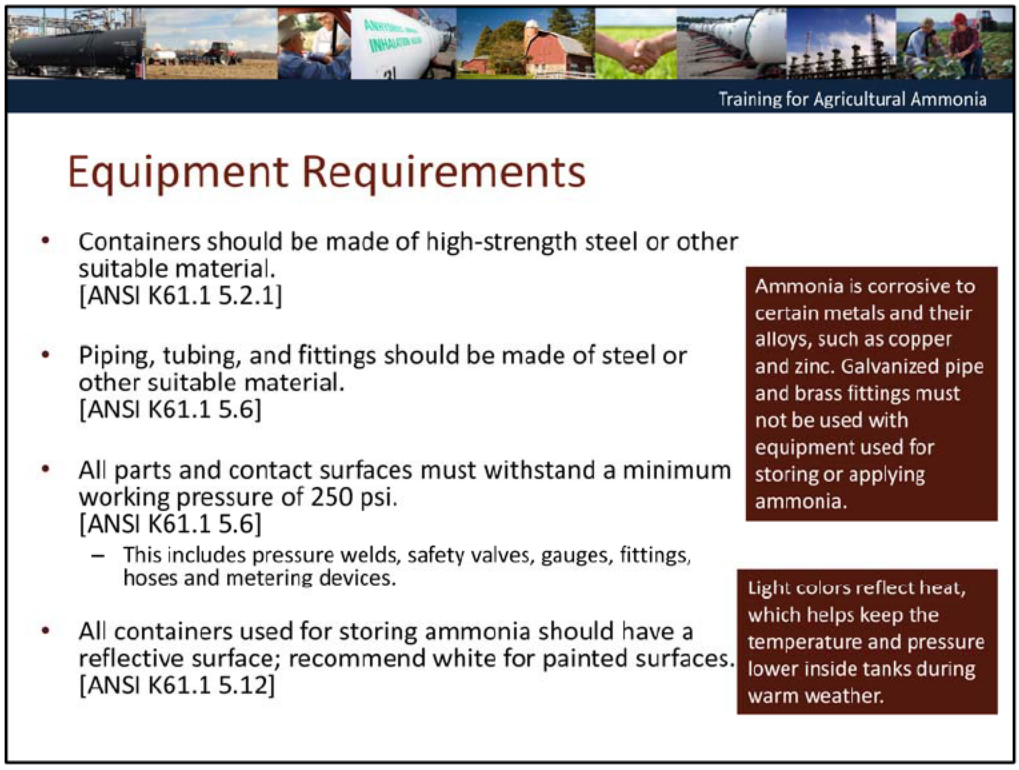
•Will look to see that you have underground pipe testing procedures and records.

Industry Standards

Meet the guidelines provided by the following standards:

- ANSI K61.1/CGA G-2.1: American National Standard Safety Requirements for the Storage and Handling of Anhydrous Ammonia (1999) (New edition anticipated)
- ASME Boiler and Pressure Vessel Code, Section VIII Division 1, 2007 Edition

Throughout this training, we have made reference to other national standards that apply. These include the American National Standard Safety requirements for the Storage and Handling of Anhydrous Ammonia, referred to as K61.1. In addition, ammonia storage tanks should be certified to the AMSE Boiler and Pressure Vessel codes.



The K61.1 standards include specific equipment requirements that apply to ammonia tanks and piping components. These include appropriate construction materials such as high-strength steel or other suitable materials, pressure tolerances to at least 250 psi, and a reflective color for ammonia tanks such as painting with a white or silver color to help reflect heat off the tanks. Since ammonia is corrosive to certain metals, the K61.1 standards also prohibit the use of galvanized pipe or brass fittings for equipment used to store or transfer ammonia.

EPA notes that your facility may also be subject to State-specific codes and requirements and you should check to see if any state or local requirements apply in addition to the National standards summarized in this training.

Where to Get Additional Help

- EPA RMP Hotline: 1-800-424-9346
- Risk Management Program information at EPA's RMP Website: www.epa.gov/oem/content/rmp
- Question and Answer website: http://emergencymanagement.supportportal.com/link/portal/23002/23016/ArticleFolder/598/Risk-Management-Program
- General Duty Clause Fact Sheet: www.epa.gov/osweroe1/docs/chem/gdc-fact.pdf
- myRMP located at:
  - (https://www.asmark.org/myRMP/Suite.shtml?Continue=I+Accept)
- *Risk Management Program Guidance for Retail Agricultural Facilities* (also available from the myRMP website)
- A self-paced version of this webinar will be posted on EPA's website in the near future.

We thank you for your time in reviewing this training presentation on the Risk Management Program for retailers and suppliers of agricultural ammonia. To help you find additional information please refer to the following helpful resources.