MOC 2766

STANDARD OPERATING PROCEDURE
Raleigh Pharmaceutical Plant

DEPARTMENT	SECTION	NUMBER
WH	IV	005
☐ Original	☒ 12th Revision	Page 1 of 9

Title: Anhydrous Ammonia Tank Truck

Issued by: Tim Hunt TH **Issue Date:** 6/20/2000 **Department Responsible:** Warehouse

Approved by: [signature] **Date:** 6/28/00 **Quality Approval:** Susan B Batts **Date:** 6/29/00

Purpose: Safely Unload Anhydrous Ammonia.

Reference: None

Forms Required: Bill of Lading
Procedure Checkoff Sheet for Unloading Anhydrous Ammonia
Receiving Report copy of the Purchase Order
Material Safety Data Sheet for Anhydrous Ammonia

Reports Required: None

Responsibilities:

Warehouse Foreman or Clerk.

1. Send the Accounts Payable copy of the Receiving Report, the completed Checkoff Sheet, and the Bill of Lading to the Cost Accountant.

2. Send the Requisitioner's copy of the Receiving Report to the Purchasing Supervisor.

Warehouse Operator

1. Be familiar with the Material Safety Data Sheet for Anhydrous Ammonia. This MSDS is located in the Pap Plant shed MSDS Book.

2. Be familiar with the Anhydrous Ammonia Emergency Planning and Response section of this SOP. Follow this section in the event of a spill or leak.

3. Notify the Pap Plant and Warehouse Foreman of any problems or leaks.

4. Unload the tank truck according to the Checkoff Sheet.

5. Notify the PAP Plant Foreman prior to unloading.

6. Take the completed Procedure Checkoff Sheet and the Bill of Lading to the Warehouse Office.

7. Receive the tank truck into the computer and turn in all paperwork to the Warehouse Office daily.

Title: Anhydrous Ammonia Tank Truck

Procedure:

_____ 1. Upon arrival of the truck, chock the trailer wheels. Explain what action the driver should take in the event of an emergency. Explain to the driver that if he needs to leave the area for any reason (i.e., phone, rest room) this is the time to do it because **he must stay with the truck once unloading begins.** ***(** Safety Note # 1/Consequence of Deviation ** This ~~is a~~ is an administrative safety control to ensure that in the case of a emergency the tank truck unloading process can be stopped. The Ammonia Driver must sign below stating that he has reviewed Step 1 of this SOP, and that he will stay with his truck while unloading, and that he will return to his truck and stay there unless instructed to do otherwise should the emergency alarm sound.)***

Driver Sign Here: _____ **Date:** _____ **Time:** _____

_____ 2. Ask the driver for the Bill of Lading with weight ticket. Ask the driver if he weighed in on the scales at the guardhouse. Sign and date the Bill of Lading. Retain a copy of it along with the weight tickets for receiving purposes. The driver must have a gross weight before unloading can begin. (If the site scales are not working we will use their weight ticket.) An empty weight ticket can be faxed back to the PIC Clerk upon the traffic supervisor's approval.

Record tank truck number here: _____

_____ 3. Review the attached map of the rail yard area to identify the location of the rail cars, chemicals, safety showers and evacuation alarm or horns. Check the tank truck to locate and understand the emergency shut off levers on the Ammonia Tank Truck. If unsure how they work ask the driver to explain it to you.

_____ 4. Put on the necessary protective clothing: PVC gloves and a full-face shield. You must have with you a full-face respirator with Green Ammonia canister, in case of an ammonia leaks.

(**Safety Note # 2/Consequence of Deviation ** Anhydrous Ammonia is a colorless gas or liquid with an extremely pungent odor that is irritating to the eyes and mucous membranes. The liquid can cause painful skin and tissue damage by freezing. Refer to the MSDS as necessary. The MSDS is located in the Pap plant shed at the rail yard.)

If at any time you discover an ammonia leak or release, you should stop all surrounding activity. Have the driver shut down his unloading of ammonia. Close all valves that are used to unload ammonia. If possible approach the leak from the upwind direction to determine if you have a vapor or liquid leak. If possible close off the tank and or lines to stop or minimize the release. Using the 2-way radio call for help from your warehouse foreman, or the pap-manufacturing foreman. Follow the Anhydrous Ammonia Emergency Planning and Response section at the end of this SOP. You must activate the emergency alarm system for any large leak, or any leak that you can not easily and quickly stop.

Follow the Raleigh Plant Emergency Response Plan section # XVII for any release that could send ammonia vapors beyond the property boundary.

Procedure:

_____ 5. Notify the manufacturing supervisor by radio before unloading. Ask the PAP supervisor if there is anything at the Ammonia unloading area or at the rail car area that you should be aware of before pumping. Also ask if both tanks are OK to fill.

_____ 6. Ground the tank truck with the ground clamp, rope off the area with stringers and put up the DANGER AMMONIA TRUCK UNLOADING signs. Check the physical condition of the exterior of the hose. Check the hose replacement date stamped on the side of the hoses. (**NOTE:** If hoses show any signs of wear or is past it's expiration date do not use it. Contact your Foreman for a replacement hose if needed.) Check the valve on the product hose for signs of leaks. Have the truck driver hook up the hoses to the liquid and vapor connections on the truck.

_____ 7. **Check and test the nearest safety shower to be sure it works. If it does not work, notify your supervisor immediately. Do not start unloading the tank truck if the safety shower does not work.**

_____ 8. The warehouse operator will check the liquid and vapor hoses to ensure proper plant connections labeled liquid and vapor. Refer to the Diagram at the end of this procedure.

_____ 9. The warehouse operator will set the valves on the hill for unloading into either the east tank or the west tank. The liquid inlet valve and the vapor inlet valve on the tank should be open going to the tank being filled. **All excess flow bypass valves must be closed while you are pumping.**

_____ 10. **Have the driver open the vapor valve on the truck slowly. Then open the unloading station vapor valve slowly.** ***(** Safety Note Number 3/Consequence of Deviation ** If the valves are opened too fast it may cause the excess flow vapor valve to close. If the excess flow valve should close on you, shut the system down and allow the excess flow valve to reopen. This may take several minutes. The excess flow valve has a very small hole in it to allow the line to equalize and the valve to reopen. You may have to open one or more of the excess flow valve by-pass valves in order to get the line pressure to equalize so that the excess flow valve will re-open.)***

_____ 11. Log the levels, pressures, and temperatures of both storage tanks below. This data will be used as reference points for later comparisons during unloading. **(See Step # 18.)** The tank pressure should not exceed 175 PSIG.

	Level	Pressure	Temperature
East Tank	_____	_____	_____
West Tank	_____	_____	_____

(Safety Note Number 4/Consequence of Deviation ** The relief valves for the hill tanks are set at 250 PSIG. 175-PSI limit on the ammonia tank pressure is an administrative safety control to ensure that ammonia is not released from the vessel from overfilling and over-pressurization. Pressure above this may cause the pressure relief valves to release ammonia vapor to the air.)***

Procedure:

_____ 12. Determine the most appropriate tank to fill based on tank levels; tanks **must not be filled beyond 80% of its capacity.** A truckload of Ammonia will raise the volume in the tank by about 25% depending on the temperature. **Neither storage tank should ever be filled too more than 80% of its capacity. Destination tank:** ☐ **East Tank** ☐ **West Tank (Check One)**
***(** Safety Note Number 5/Consequence of Deviation ** Filling the vessel no more than 80% full is an administrative safety control to ensure that ammonia is not released from the vessel from overfilling and over-pressurization. Do not fill the ammonia vessel over this level. Liquid ammonia expands as its temperature rises. If overfilled it could be possible, with sufficient increase in temperature, for a container to become liquid full and therefore release ammonia from its vent. The ammonia tank has volume percentages on the upper range of the level gauge, which correspond to different temperatures. When filling the tank, the volume when 80 % full should not exceed the level percentage that corresponds to the temperature of the tank contents. If you have any questions about this, contact your supervisor!)*

_____ 13. Check the pressure of the storage tank and truck for equalization (must be within 10 PSIG) and **log the pressure of the tank.** _____ If the pressure of the tank and the pressure of the truck are not within 10 PSI of each other, **DO NOT PUMP.** Close the vapor valves. Wait 10 minutes and try again, opening the valves very slowly. **If this does not work you will have to open the 4 bypass valves that by-pass the excess flow valves. Open one valve at a time while holding the SS tubing. When you get to the one that has closed you will be able to feel and hear the liquid moving inside the tubing. This valve should be held open for several minutes, or until you hear a distinct click of the excess flow valve opening. Then close the by-pass valve. If this does not allow the excess flow valves to open and you are still unable to equalize close all valves and call your supervisor.** ***(** Safety Note # 6/Consequence of Deviation ** The 10 PSI is an administrative safety control to ensure that ammonia is not released from the vessel from overfilling and over-pressurization. Maintaining the pressure balance within 10psi will prevent the excess flow valves from slamming shut. If equalization fails, it is a sign that there may be a closed valve (manual valve, back flow prevention valve, or excess flow valve) or a plugged lined.)* After equalization occurs, the operator will open the liquid valve on the unloading station slowly. Then have the driver open the liquid valve on the truck slowly.

_____ 14. Have the driver start the pump on the truck. Do not exceed 195-PSI line pressure at the loading station. Watch the sight glass in the fill line. If you can not see through it at any time, or the sight glass develops a brown film, have the driver shut down, and close the valves at the unloading station. Contact the Pap Plant and Warehouse Foreman and inform them of the problem. Follow their instructions at this point. ***(** Safety Note # 7 /Consequence of Deviation ** The 195 PSI line pressure is an administrative safety control to ensure that ammonia is not released from the pressure release safety valves on the pipe lines from over-pressurization. By maintaining the pressure at or below 195 PSI it will help prevent the excess flow valves from slamming shut and the pressure release*

Procedure:

valves from popping off.) **If the pressure release valves activate, it is a sign that one of the excess flow valves has slammed shut. You must then have the driver shut his truck down, and start over at line 13 above. If the pressure release valve on the line should fail to reseat, immediately contact your supervisor or the PAP plant supervisor.)**

NOTE: MAXIMUM PUMPING RATE IS 100 GALLONS PER MINUTE.

***(** Safety Note # 8/Consequence of Deviation ** The rate of 100 GPM is an administrative safety control to ensure that the excess flow valves built into the ammonia lines do not close while you are unloading the tank truck. These valves are designed to close if the pumping rate exceeds 110GPM, or if you have a line failure. In the case of a line failure they will help to reduce the amount of ammonia that may be released.)* If there are any leaks, you must shut down and secure the operation. If it is a small leak or if you need to tighten a coupling, correct the problem and resume unloading. If the problem is something more involved, notify your supervisor at once.**

_____ 15. The truck driver must remain with his truck once pumping has started. *(SEE SAFETY NOTE #1)* The warehouse operator should do all volume readings and pressure readings and all information should be recorded.

_____ 16. Periodically check the pressure and level gauges on the tank you are filling to see if the Ammonia is flowing. There should be an increase in the levels shown. If there are further difficulties, call your supervisor.

Tank _____ **Level** _____ **Pressure** _____ **Temperature** _____
Tank _____ **Level** _____ **Pressure** _____ **Temperature** _____

(See Safety Note # 5)

_____ 17. If material is flowing, continue to unload until you have emptied the tank truck, while guarding against over pressurization of the hill tank by more than 175 PSIG. (The relief valves are set at 250 PSIG.) The level gauge should show an increase of about 25% depending on temperature. (If it appears the tank will not hold the entire load, stop pumping, close the liquid unloading valve, and call your supervisor.) **DO NOT FILL THE AMMONIA TANK BEYOND 80 % OF ITS CAPACITY.** *(SEE SAFETY NOTES # 4 AND 5.)*

_____ 18. When this procedure is complete, have the driver stop the operation.

_____ 19. Have the driver close the liquid and vapor valves to the truck. The warehouse operator will close the liquid and vapor inlet lines at the unloading station.

_____ 20. At this point, the warehouse operator will call on the radio to the PAP supervisor to see if it is OK to bleed the Ammonia to the scrubber.

_____ 21. The warehouse operator will open the liquid and vapor line at the scrubber and bleed the liquid and vapor into the scrubber until free of pressure.

Procedure:

_____ 22. The warehouse operator will close the liquid and vapor inlet valves when complete and have the truck driver disconnect the hoses from his truck. If the truck must backup to get out of the unloading area, the warehouse operator must stop traffic that might interfere with his backing out safely. Operator must also warn pedestrians of the moving hazard.

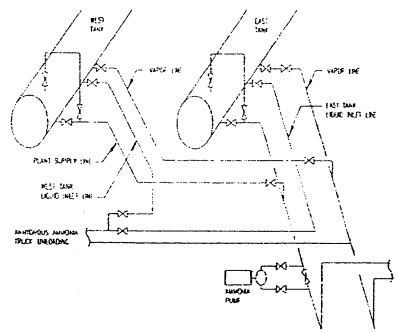
_____ 23. If necessary, the warehouse operator will reset the valves to meet the plant's requirements.

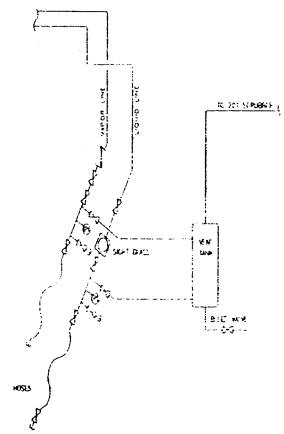
_____ 24. **Record ending level in the receiving tank here:** _____

_____ 25. Sign the necessary paperwork for the driver. **Record the time you finish unloading the tank truck here:** _____. Put away all equipment when finished.

_____ 26. Get the correct Receiving Report from the files in the Warehouse Office. After making sure you have all the necessary information, go to the computer and get the next raw material lot mark. Fill out the receiving report and enter the correct information into the computer. Record information in the Warehouse Lot Mark Book.

SEE PIPING DIAGRAM ATTACHMENT





Procedure:

Guide to the Anhydrous Ammonia Emergency Planning, Response and Ammonia Alarm System

In the event of a spill or leak of Anhydrous Ammonia, the following steps should be taken.

1. Sound the alarm to get help in the area. This can be done by Radio or activating the Emergency alarm. If you have skin contact, flood with water immediately for at least 15 minutes. Remove clothing from the contaminated area. In case of severe exposure, notify Health and Safety for additional medical attention.

2. Notify the Environmental Department and Health & Safety. Follow site Emergency Response Plan.

3. Rescue duties should be directed by the supervisor in charge.

4. Escape procedure and route should be - put your face in the wind and leave the immediate area of leak or spill.

5. Procedure for employees handling the critical work should be - put on protective clothing: full PVC suit, PVC boots, and a full-face respirator with Anhydrous Ammonia canister or self-contained breathing apparatus. In the event ammonia concentration cannot be determined, level "A" clothing and full encapsulation suit should be utilized for handling large liquid spills or vapor clouds.

6. Secure the leak if at all possible. If not, close the outlet valve on the storage tank or tanker being unloaded.

These following guidelines are to be followed by Warehouse personnel when an alarm sounds, on the ammonia alarm system.

The ammonia spill control system includes an array of ammonia sensors around the vaporizers, ammonia truck unloading station and the ammonia tanks. The ammonia sensors will activate an alarm any time an ammonia concentration of 50 PPM is detected.

If the ammonia alarms are activated, **immediately** investigate to find the source of the alarm. If the alarm was caused by an ammonia leak, notify the foreman. If there is an actual ammonia spill, activate the plant emergency horns and notify the foreman.

If ammonia is detected by one or more of the sensors around the **vaporizers**, indicators AAH-0250-49A (VAPORIZER STATION SPILL ALARM) on the panel at the Ethomeen building and AAH-0250-49B (VAPORIZER STATION SPILL ALARM) on the panel at the 2nd floor of 201 hydrogenation will flash on and off, and alarm horns at all three panels will turn on. Pressing button HS-250-1A (HORN SILENCE) on the panel at the Ethomeen

Procedure:

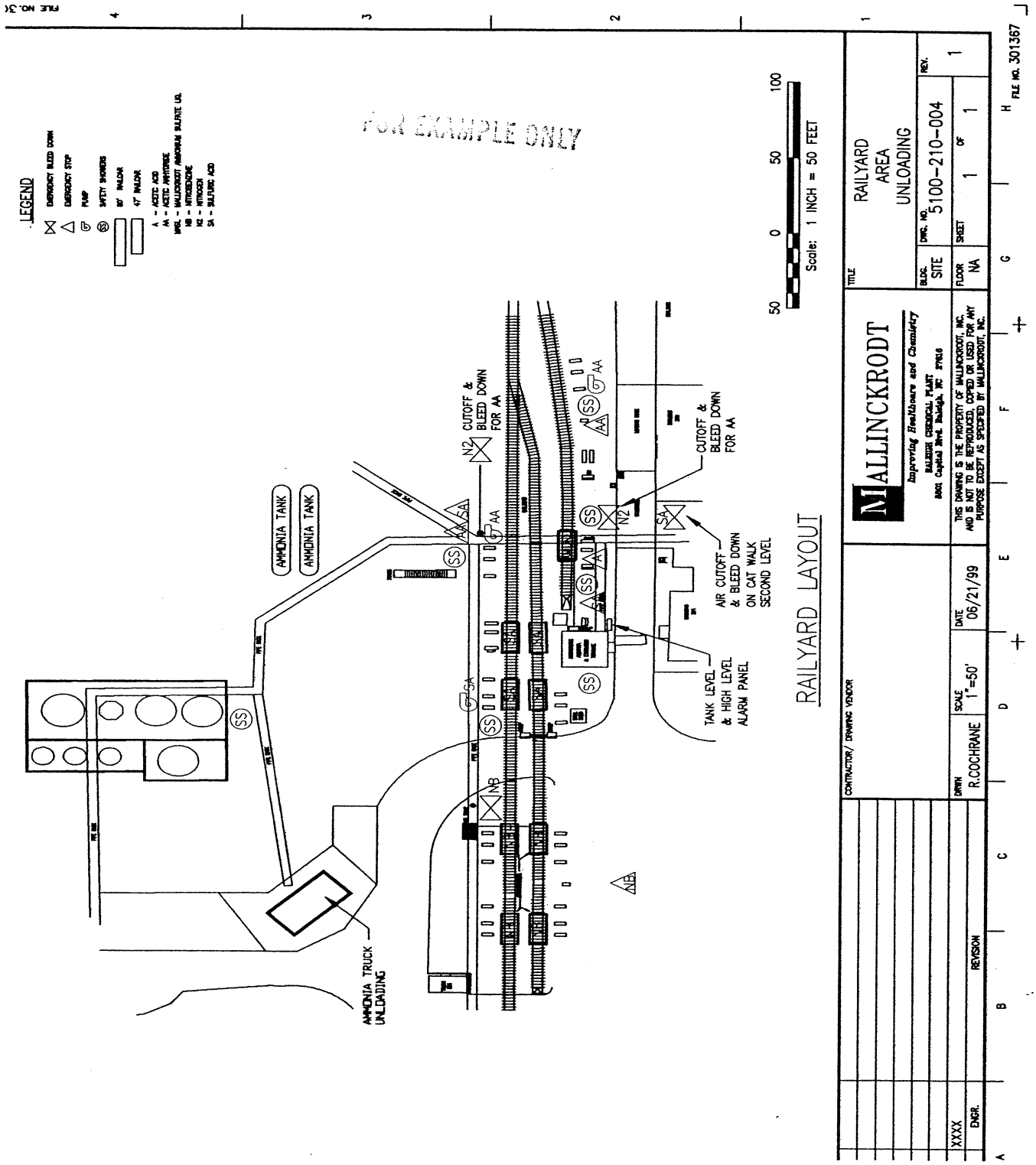
building, button HS-250-2A (HORN SILENCE) on the panel at the unloading station, or button HS-250-3A (HORN SILENCE) on the panel at the 2nd floor of 201 hydrogenation will silence the alarm horns and turn the indicator lights on continuously. When the alarm condition clears (ammonia is no longer detected), the indicator lights will turn off automatically.

If ammonia is detected by one or more of the sensors at the **unloading station**, indicators AAH-0250-50A (UNLOADING STATION SPILL ALARM) on the panel at the Ethomeen building and AAH-0250-50B (UNLOADING STATION SPILL ALARM) on the panel at the 2nd floor of 201 hydrogenation will flash on and off, and the alarm horns at all three panels will turn on. Pressing button HS-250-1A (HORN SILENCE) on the panel at the Ethomeen building, button HS-250-2A (HORN SILENCE) on the panel at the unloading station, or button HS-250-3A (HORN SILENCE) on the panel at the 2nd floor of 201 hydrogenation will silence the alarm horns and turn the indicator lights on continuously. When the alarm condition clears (ammonia is no longer detected), the indicator lights will turn off automatically.

If ammonia is detected by one or more of the sensors around the **south end of the ammonia tanks**, indicators AAH-0250-52A (SOUTH END TANKS SPILL ALARM) on the panel at the Ethomeen building and AAH-0250-52B (SOUTH END TANKS SPILL ALARM) on the panel at the 2nd floor of 201 hydrogenation will flash on and off, and the alarm horns at all three panels will turn on. Pressing button HS-250-1A (HORN SILENCE) on the panel at the Ethomeen building, button HS-250-2A (HORN SILENCE) on the panel at the unloading station, or button HS-250-3A (HORN SILENCE) on the panel at the 2nd floor of 201 hydrogenation will silence the alarm horns and turn the indicator lights on continuously. When the alarm condition clears (ammonia is no longer detected), the indicator lights will turn off automatically.

If ammonia is detected by one or more of the sensors around the **north end of the ammonia tanks**, indicators AAH-0250-51A (NORTH END TANKS SPILL ALARM) on the panel at the Ethomeen building and AAH-0250-51B (NORTH END TANKS SPILL ALARM) on the panel at the 2nd floor of 201 hydrogenation will flash on and off, and the alarm horns at all three panels will turn on. Pressing button HS-250-1A (HORN SILENCE) on the panel at the Ethomeen building, button HS-250-2A (HORN SILENCE) on the panel at the unloading station, or button HS-250-3A (HORN SILENCE) on the panel at the 2nd floor of 201 hydrogenation will silence the alarm horns and turn the indicator lights on continuously. When the alarm condition clears (ammonia is no longer detected), the indicator lights will turn off automatically.

Procedure:


FOR EXAMPLE ONLY
LEGEND
Scale: 1 INCH = 50 FEET
AMMONIA TANK
AMMONIA TANK
CUTOFF & BLEED DOWN FOR AA
CUTOFF & BLEED DOWN FOR AA
AIR CUTOFF & BLEED DOWN ON CAT WALK SECOND LEVEL
TANK LEVEL & HIGH LEVEL ALARM PANEL
AMMONIA TRUCK UNLOADING
RAILYARD LAYOUT
RAILYARD AREA UNLOADING
ALLINCKRODT
DWG. NO. 5100-210-004
DATE 06/21/99
SCALE 1"=50'
DRWN R.COCHRANE
ENGR. XXXX
REVISION