

Ethanolamines/Glycol Ethers

Tier 3 Procedure

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Original Date: 11-11-91 **Author:** Mike Viator
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Title: Ammonia Tank Car Unloading
References: Glossary Of Equipment Identification (Text # 114) QSP03,05,11 AND
1505 Handling non-conforming product

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200. Ammonia Tank Car Off-Loading

1.0 Objective:

1.1 To unload anhydrous ammonia tank cars to DS-205 in an environmentally sound and safe manner while preserving the quality of the ammonia.

2.0 Responsibility:

2.1 It is the responsibility of the operations personnel to ensure the on going completeness and effectiveness of ammonia off loading.

2.2 Operations personnel are responsible for ensuring that ammonia is off-loaded according to written procedures, recorded using the appropriate check sheet and by confirming the existence of the correct paperwork.

3.0 Certificate Of Analysis:

3.1 Check the raw material book for the C.O.A.

4.0 Method:

4.1 Anhydrous ammonia tank cars are off loaded using vapor pressure differential produced by a compressor. The liquid is taken off through a dip leg.

5.0 Procedure:

5.1 General:

5.1.1 The tank car must be monitored at all times during the off loading process. This can be done by using the control room camera system if operational; otherwise, an operator is required to remain with the tank car at all times (this is a DOT requirement).

5.2 Inventory:

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5.2.1 Check the control monitor to confirm that DS-205 (ammonia storage sphere) will hold the amount of material in the tank car. Maximum level is less than 500,000 pounds. The tank will hold approximately 800,000 pounds but the inventory is kept at less than 500,000 pounds as a safety and environmental precaution.

5.3 Safety equipment:

5.3.1 Use proper safety equipment - monogoggles, rubber gloves. Full face gas mask is recommended but not required (individual discretion will decide use of gas mask). Rubber gloves required for sampling only.

5.4 Emergency equipment:

5.4.1 Check emergency equipment - escape air units. Know the location of the nearest emergency shutdown switch, safety shower, intercom, deluge guns and both sprinkler trips. Be sure safety gates are closed on escape ladders.

5.5 Check sheet:

5.5.1 Fill out appropriate section of check sheet. Note that the check sheet has a section for before off-loading and after off-loading. Attach C.O.A. to check sheet before offloading.

6.0 Track And Tank Car Securement:

6.1 Position blue flags and derailleurs and turn on blue light. These actions will disallow the unauthorized entry of a switch engine or track mobile.

6.2 Chock the tank car and attach the ground clamp. Also attach ground indicator making sure the green indicator light is on.

7.0 Sampling:

7.1 Using an approved ammonia sampling cylinder, obtain a sample from the tank car and check for color as well as running a gas sample on the infrared spectrophotometer. The sample must be recorded and approved by the operations personnel.

8.0 Compressor And Connection Check:

8.1 Check oil level in C-205 (compressor) and check knockout pot for any liquid.

8.2 Connect liquid and vapor loading arms to the tank car. Make sure all bleed valves to the scrubber are closed. Note: one operator is acceptable to connect the car to the loading arms, however, two are recommended.

9.0 Set Up To Start Off Loading:

9.1 Crack tank car valves to check for connection leaks. If one of the valves leaks and needs to be repaired call material flow so the car can be repaired. Also hang a tag on the valve stating the problem. If no problems, fully open valves on top of the tank car.

9.2 Open valves, crack water valve slightly to scrub ammonia for compressor crankcase.

9.3 Operator to line up manual valves and check compressor for normal service as per procedure.

9.4 Call the control room and have the board person reset the ammonia compressor.

9.5 On the panel near C-205, place both butterfly switches for liquid and vapor in the open position. Allow pressure to equalize.

9.6 Operator will select liquid off-loading selection switch and verify the position of the valves.

9.7 Start C-205, making sure that all valves are opened to off load the tank car into DS-205. Note: For a tank car that presents no checking problems the differential across C-205 can be as high as 30 psig. For cars that present checking problems (known ahead of time start off-loading with compressor by-pass valve open and slowly close back until the level in DS-205 begins to rise. (Use the bypass controller in control room.) For cars that check due to high pressure differential, the car will have to be bled down to an acceptable differential (5-10 lbs.) and the instructions stated for cars that are known to present checking problems followed.

9.8 Operator will start the compressor with the boardman having control of the compressor bypass.

9.9 The boardman will close and open the compressor bypass as needed in the off-loading process.

9.10 The tank car is empty when DS-205 level has lined out and the computer calculation of amount off loaded matches amount shipped.

9.11 Close tank car valves and listen for excess flow through check valves. This could mean that the car is not completely empty.

10.0 Evacuation of Ammonia:

10.1 The boardman will instruct the outside operator to go to the compressor and line up the system for vapor off-loading.

10.2 Operator will select vapor off-loading switch.

10.3 Verify the AOV's position so the compressor can pull vapor from the tank car into DS-205 vapor space.

10.4 Monitor tank car pressure or C-205 suction pressure and stop the compressor when it reaches 45 PSIG. The board operator will get a suction pressure alarm at 45 lbs. and the compressor will trip at 38 lbs. Do not wait for compressor to trip by itself.

10.5 Close the 2" valves on the loading arms and open the bleed valves on the couplings to be sure that neither the tank car valves nor the loading arm valves are leaking. Note: If off loading an ammonia car is interrupted and the arms have to be disconnected, the liquid arm will still be liquid full and has to be vented to the scrubber to prevent over pressuring. Under normal off loading conditions, the liquid arm will be liquid free at the conclusion of off loading.

10.6 Disconnect off loading lines and replace all covers and plugs on the tank car. Plugs must be wrench tight. Secure off loading arms to the rack.

10.7 Block in the water to the vent scrubber after making sure the bleeds to the scrubber are blocked in.

10.8 Remove the ground wires and chocks.

10.9 Turn off the blue light and flip derailleurs (if no other rail activity is taking place).

10.10 If any problems are found, such as leaks or mechanical problems note on the check sheet, notify any appropriate personnel (if necessary).

11.0 AOV Valving Alignment/Verification:

11..1 As of the original date of this procedure, manual valving of this system must occur as follows:

11.1.1 Open vapor solenoid on tank car when car has finished.

11.1.2 West manual B/V and AOV #1 should be open.

11.1.3 East manual B/V and AOV #2 should be closed.

11.1.4 S./East manual B/V and AOV #3 should be open.

11.1.5 Vapor manual B/V on discharge should be open.

11.1.6 Manual B/V and AOV #4 on suction to C-205 should be closed.

11.2 When AOV switching system is put in service the above positions will still apply. (refer amines check sheet master copy book, section titled special system diagrams, for valving description) this diagram is controlled the same as check sheets. The master copy should stay in this book. A copy may be run off as needed and destroyed when the job for which it was copied is complete.

12.0 Revisions:

Revision #1	02-19-96	Yearly Review
Revision #2	06-11-96	Minor word/spelling changes Added last sentence in section 3.1 Revised 2.1, 2.2, 10.11, 9.6 Added last sentence to 5.2.1 Added C-205 tank car compressor flow chart
Revision #3	10-07-96	DOT requirement change. Placards must reflect "loaded" status even when empty. Modified 10.9.
Revision #4	01-29-98	Revised 2.2, 3.1, 5.5.1, 7.1, 10.1, 10.3, Deleted 9.2, 10.4, 10.12