

Ethanolamines/Glycol Ethers

Tier 3 Procedure

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Title: Ammonia Tank Car - Leaking Vapor Valve on GATX 11391
References: Glossary Of Equipment Identification (Text # 114) QSP03,05,11 AND
1505 Handling non-conforming product, Ammonia Tank Car Unloading

5017. Ammonia Tank Car - Leaking Vapor Valve on GATX 11391

1.0 Objective:

1.1 To unload anhydrous ammonia tank car GATX 11391 to DS-205 in an environmentally sound and safe manner while preserving the quality of the ammonia. GATX 11391 has a leaking vapor valve. This valve has a plug which prevents it from releasing material to the environment.

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 specialists and/or senior operations specialists 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 The ammonia program on the PDP-11 must be checked to confirm receipt of the certificate of analysis on the tank car to be off loaded. If a certificate has been received, a "y" will be present in the column titled "cert"(certificate of analysis). The presence of the confirming "y" is required to proceed with the unloading procedure. If the "y" is not present the board operator may approve the shipment after reviewing the IR and color analysis.

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. Since the vapor valve on GATX 11391 is non-operational, a second empty ammonia tank car will be connected to GATX 11391 and also connected to C-205 as in the Ammonia Tank Car Off-Loading procedure. This empty tank car will serve as a knock out pot to prevent liquid from being sucked into the compressor. Bottle banks of nitrogen will also be attached to GATX 11391 to provide a motive force if necessary to transfer ammonia to the empty car.

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:

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. **Supplied breathing air must be available in the area. The crew in the field must be in radio contact at all times with the control room.**

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.

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 Check 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 supervisor, lead senior operations specialist or board operator. **Sampling is only necessary if an acceptable C of A does not exist.**

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 empty 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.
- 8.3 **Connect one liquid valve of GATX 11391 to the spare liquid line on the empty tank car. The connection should be a flex hose with double block and bleed connections.**
- 8.4 **The nitrogen bottle banks should be connected to the other liquid line on GATX 11391 with ¾" ss tubing. A double block and bleed system should be installed downstream of the nitrogen bank regulator. The pressure on the regulator should be set at 140 psig.**
- 8.5 **Pressure gauges should be installed on each tank car.**
- 8.6 **Equalize the pressure between the two tank cars by opening the flex hose connections between the cars. Block these valves after the pressure has been equalized.**

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 Call control room and have the board person get a start reading on DS-205 as well as call up "NH3car" on the PDP-11.
- 9.3 Open valves, crack water valve slightly to scrub ammonia for compressor crankcase.
- 9.4 Operator to line up manual valves and check compressor for normal service as per procedure.
- 9.5 Call the control room and have the board person reset the ammonia compressor.
- 9.6 On the panel near C-205, place both butterfly switches for liquid and vapor in the open position. Allow pressure to equalize.
- 9.7 Operator will select liquid off-loading selection switch and verify the position of the valves.
- 9.8 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.

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

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

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

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

9.13 **Shutdown the transfer and block in the valves to C-205.**

9.14 **Return to 8.6 and repeat this procedure until no ammonia can be transferred by differential pressure equalization. At that point pressure the ammonia from GATX 11391 to the empty car with nitrogen.**

10.0 Evacuation of Ammonia:

10.1 The boardman will shutdown the compressor when the car is liquid off-loaded. He 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. Before starting compressor allow pressure to equalize for about 10 minutes. **Keep the valves between the two cars open during this process.**

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

10.5 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.

10.6 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.

10.7 **Evacuate the two tank cars through the scrubber.**

10.8 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.

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

10.10 Remove the ground wires and chocks.

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

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

10.13 Remove the tank car from the computer "program using the off load option and stop "NH3car" program.

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